Microsoft® Lync™ Server 2013

Enhanced Gateway

Mediant Gateway family

Configuration Note

AudioCodes Enhanced Gateway for Microsoft Lync Server 2013

Lync

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Gold Communications

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September 2013

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Notice

This document describes the installation and configuration of AudioCodes Mediant Gateway family as Enhanced Gateway deployed in the Microsoft Lync Server 2013 environment.

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Related Documentation

Manual Name
Mediant 500 MSBR Hardware Installation Manual
Mediant 500 MSBR SIP User's Manual
Mediant 800 Gateway and E-SBC User's Manual
Mediant 1000B Gateway & E-SBC User's Manual
Mediant 2000 User's Manual
Mediant 3000 User's Manual
Mediant 800 Gateway and E-SBC Hardware Installation Manual
Mediant 1000B Gateway and E-SBC Hardware Installation Manual
Mediant 2000 SIP Hardware Installation Manual
Mediant 3000 SIP Installation Manual

1 Introduction

This document describes the installation and configuration of Enhanced Gateway (hereafter referred to as *gateway*), deployed in the Microsoft Lync Server 2013 environment.

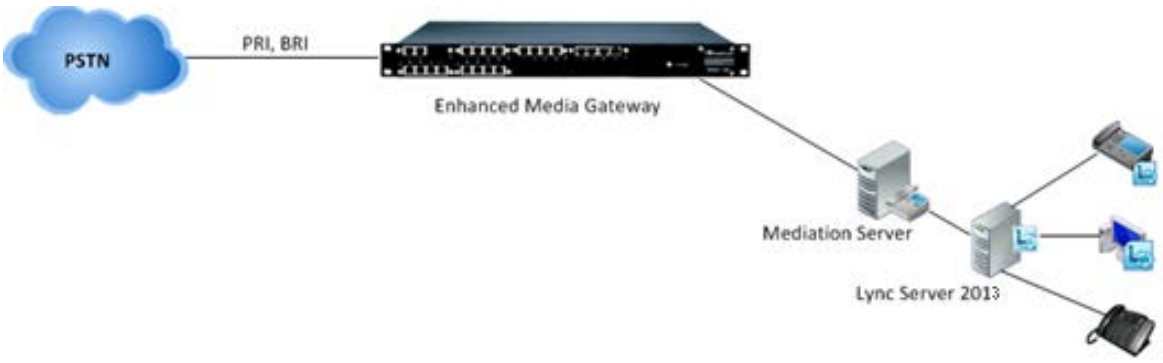
The Enhanced Gateway is typically co-located with Microsoft Mediation server at the enterprise's headquarters. The Mediation server is the Lync Server entity that is responsible for interfacing the Lync Server network with the gateway, which provides legacy connections to the public switched telephone network (PSTN) or private branch exchange (PBX).

Note: AudioCodes' SBA located at the remote branch office, can also provide Enhanced gateway functionality. For information on how to configure the SBA, refer to the relevant *SBA Installation Manual*.

AudioCodes gateways can also provide the Lync Server environment with a connection to analog devices (such as fax machines and telephones) with AudioCodes MediaPack™ 1xx series as an Analog Telephone Adapter (ATA).

Note: This document doesn't describe how to configure the gateway for communication with Analog Devices. For information on how to configure the Gateway with Analog Devices, refer to the *Enhanced Gateway and Analog Devices Configuration Note*.

Figure 1-1: High-Level Architecture of Enhanced Media Gateway



Reader's Notes

2 Component Information

2.1 AudioCodes Gateway Version

AudioCodes Gateway Version

GW Vendor	AudioCodes
Models	▪ Mediant 500 MSBR ▪ Mediant 800 Gateway & E-SBC ▪ Mediant 1000B Gateway & E-SBC ▪ Mediant 2000 Gateway ▪ Mediant 3000 Gateway & E-SBC
Software Version	SIP_6.60A or later
Protocol	▪ PRI /BRI (to PSTN) ▪ SIP/TCP or TLS (to Lync Server)
Additional Notes	None

2.2 Microsoft Lync Server 2013 Version

Microsoft Lync Server 2013 Version

Vendor	Microsoft
Model	Microsoft Lync
Software Version	Release 2013 5.0.8308.0
Protocol	SIP
Additional Notes	None

Reader's Notes

3 Assigning IP Address to PSTN Gateway

The gateway includes an embedded Web server (*Web interface*), providing a user-friendly graphical user interface (GUI) for configuration. The IP address used for accessing this Web interface must be changed to suit the networking scheme in which your Enhanced Gateway is deployed.

Before you can configure the PSTN gateway, you need to first access it with the default VoIP / Management LAN IP address, as described below.

3.1 Initial Access to the PSTN Gateway

Before you can configure the PSTN gateway, you need to access its Web interface using the default VoIP / Management LAN IP address as shown in the table below.

PSTN Gateway Default IP Addresses

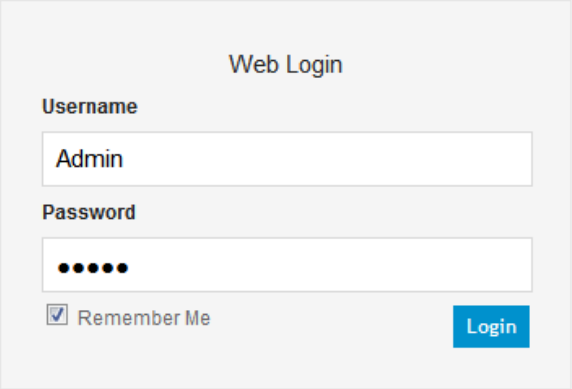
Device Name	IP Address	Subnet Mask
Mediant 3000	▪ TP-6310 or TP-8410 blade in Slot 1: 10.1.10.10 ▪ TP-6310 or TP-8410 blade in Slot 3: 10.1.10.11 (HA mode)	255.255.0.0
Mediant 2000	• Device with single module (trunks 1-8): 10.1.10.10 • Device's second module (trunks 9-16): 10.1.10.11	255.255.0.0
Mediant 1000B	192.168.0.2	255.255.255.0
Mediant 800	192.168.0.2	255.255.255.0
Mediant 500	192.168.0.2	255.255.255.0

➢ **To initially access the PSTN gateway:**

1. Connect to the **first** LAN port on the device directly to a PC, using a straight-through Ethernet cable.
2. Ensure that your PC is configured with an IP address in the same subnet as the gateway.
3. Open a standard Web browser, and then in the URL address field, enter the default VoIP / Management LAN IP address (e.g., "10.1.10.10"**)**.

   The following login screen appears, prompting you to log in with your login credentials:

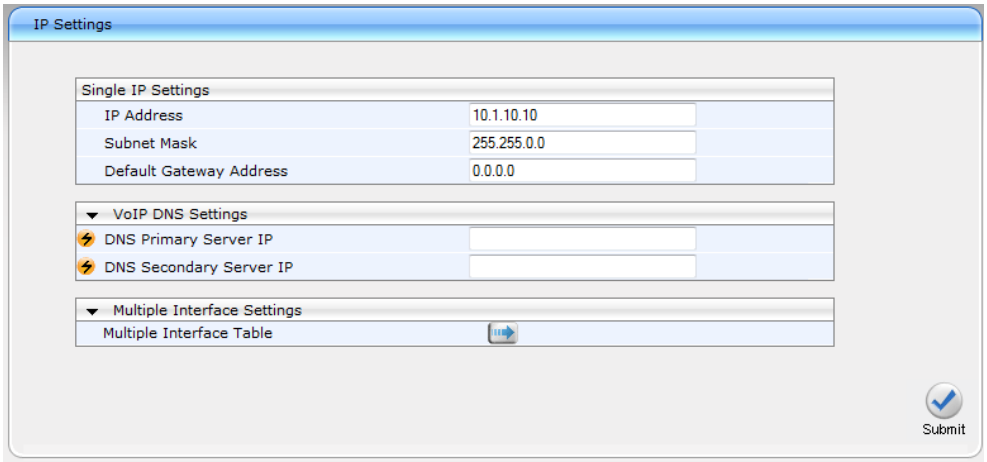
Figure 3-1: Login Screen



4. Log in with the default, case-sensitive user name ("Admin") and password ("Admin"), and then click **OK**; the Web interface appears, displaying the Home page.
5. Do one of the following:
   a. For the Mediant 500, Mediant 800, and Mediant 1000B devices:
      - Open the Multiple Interface Table page (**Configuration** tab > **VoIP** menu > **Network** > **IP Settings**) and proceed to Section 3.1.1.

   b. For the Mediant 2000 and Mediant 3000 devices:
      - Open the IP Settings page (**Configuration** tab > **VoIP** menu > **Network** > **IP Interfaces Table**), as shown below:

Figure 3-2: IP Settings Screen (Single Network Interface)



      - Click the **Multiple Interface Table** button, located under the Multiple Interface Settings group; a confirmation message box appears.
      - Click **OK**; the Multiple Interface Table page appears; proceed to Section 3.1.1.

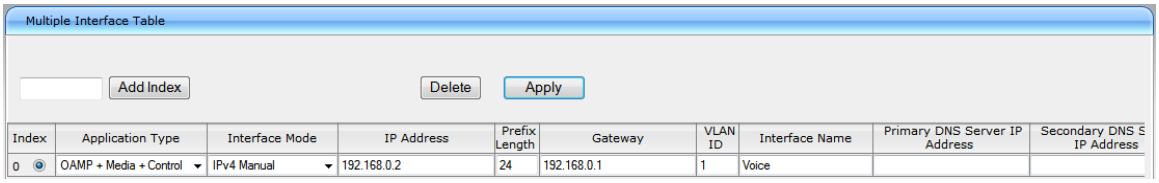
3.1.1 Assigning IP Address to the Device

This section describes how to assign an IP address to the device.

➢ **To assign an IP address to the device:**

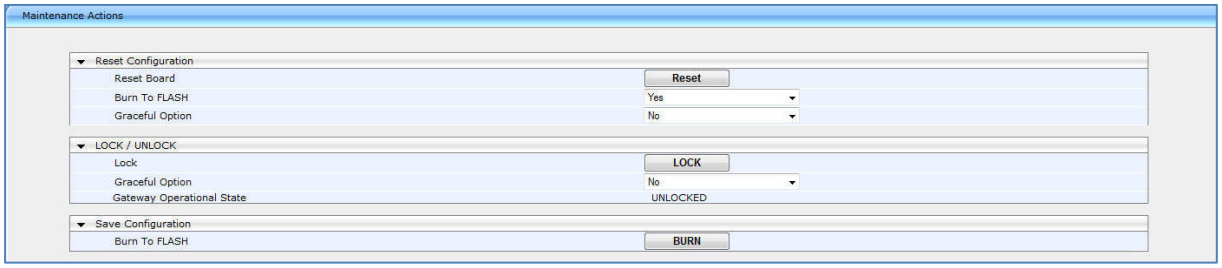
1. Select the **Index** radio button corresponding to the Application Type **OAMP + Media + Control** (i.e., the VoIP and Management LAN interface), and then click **Edit**.

Figure 3-3: IP Settings Screen (Multiple Network Interface)



2. Configure a LAN network address so that it corresponds to your network IP addressing scheme.
3. Click **Apply**, and then click **Done** to apply and validate your settings.
4. On the toolbar, from the **Device Actions** drop-down list, choose **Reset**, and then in the Maintenance Actions page, click the **Reset** button; the gateway resets and your settings are saved to the flash memory.

Figure 3-4: Maintenance Actions: Reset Gateway



5. Maintain the cabled connection between the gateway's LAN port and the computer.

Reader's Notes

4 Configuring the Enhanced Gateway

This section provides step-by-step procedures for configuring the Enhanced Gateway for scenarios where it is used **only** for connecting the Microsoft Lync environment to the PSTN network.

The configuration steps described in this section are performed through the embedded Web server (*Web interface*) of the Enhanced Gateway.

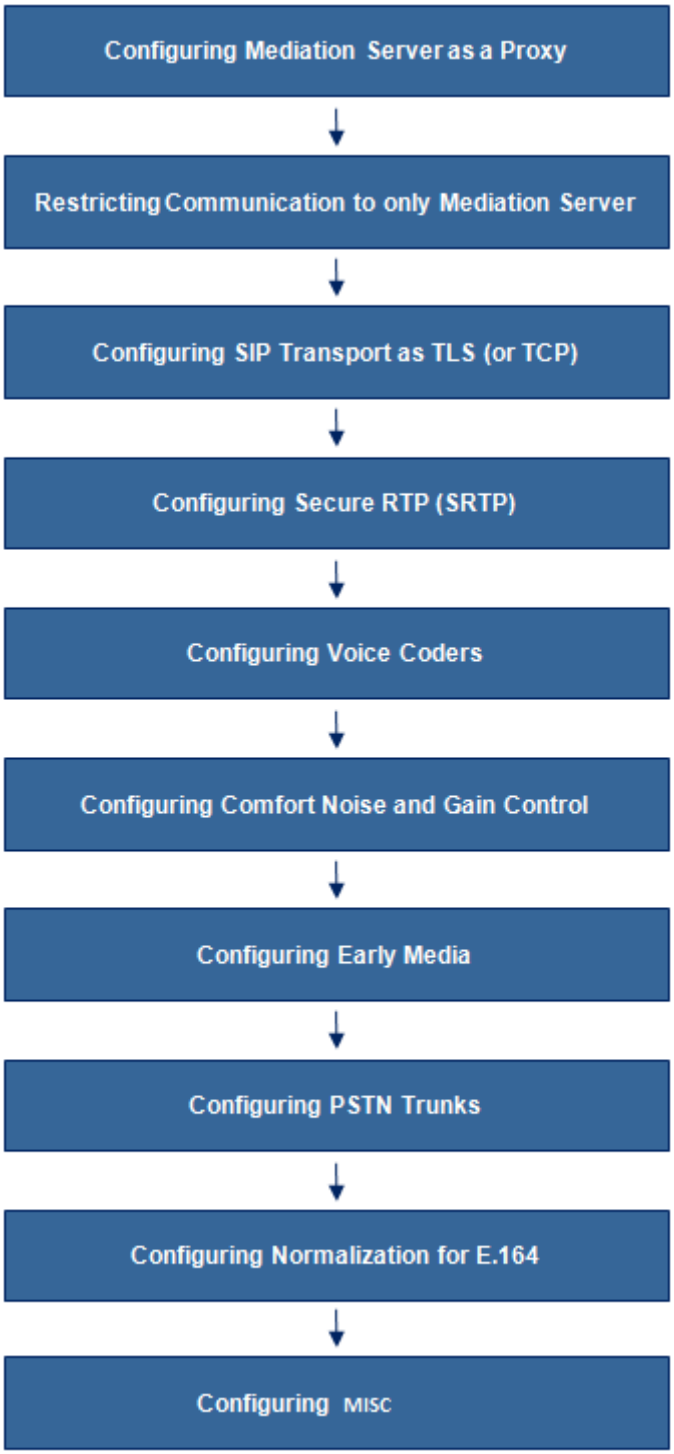
Notes:

- The gateway must be installed with a Software License that includes the following items:
  - Microsoft
  - Security
  - RTP
  - SIP

  For more information about the Software License, contact your AudioCodes representative.
- The Gateway must be installed with SIP firmware version 6.6 or later.
- This configuration of the Enhanced Gateway is relevant for both Microsoft Lync 2013 and Microsoft Lync 2010.

The steps for configuring the Enhanced Gateway are summarized in the flowchart below:

Figure 4-1: Summary of Steps for Configuring Enhanced Gateway for PSTN-Only


Configuring Mediation Server as a Proxy
Restricting Communication to only Mediation Server
Configuring SIP Transport as TLS (or TCP)
Configuring Secure RTP (SRTP)
Configuring Voice Coders
Configuring Comfort Noise and Gain Control
Configuring Early Media
Configuring PSTN Trunks
Configuring Normalization for E.164
Configuring MISC

4.1 Step 1: Configuring the Mediation Server as a Proxy

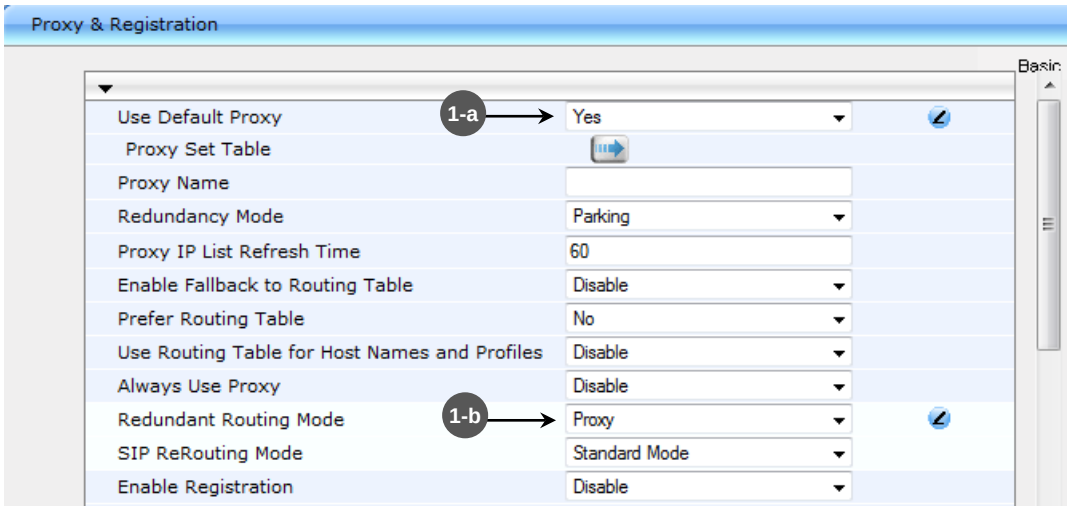
The procedure below describes how to configure the address (IP address or FQDN) of the Mediation server through which the Enhanced Gateway communicates with Microsoft Lync.

The Enhanced Gateway forwards all telephone calls (PBX/PSTN) to the Mediation server using this configured address. This address is configured in the Enhanced Gateway as a proxy server. In other words, the Mediation server acts as a proxy server (without registration) for the Enhanced Gateway.

➢ **To configure the Mediation server as a proxy server:**

1. Open the Proxy & Registration page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Proxy & Registration**).

Figure 4-2: Proxy & Registration Page



a. From the 'Use Default Proxy' drop-down list, select **Yes** to enable the Mediation server to serve as a proxy server.

b. From the 'Redundant Routing Mode' drop-down list, select **Proxy**.

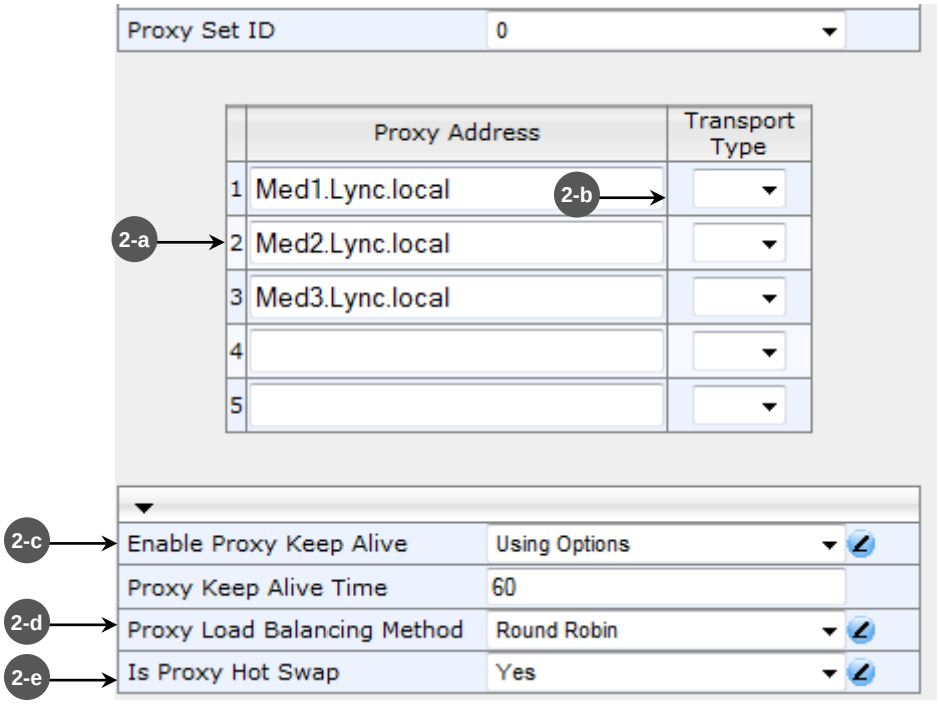
   This setting ensures that if a SIP 5xx message is received in response to an INVITE message sent to the primary proxy (i.e., Mediation server), the Enhanced Gateway re-sends it to the redundant proxy (i.e., next Mediation server). To configure alternative routing upon receipt of a SIP 503 response (as required by Microsoft Lync), see Step 3.

c. Click **Submit**.

d. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

2. Click the **Proxy Set Table** button to open the Proxy Sets Table page:

Figure 4-3: Proxy Sets Table Page



a. In the 'Proxy Address' fields, configure all Mediation server IP addresses or FQDN's with which the Enhanced Gateway is required to work.

Note: If you configured the Mediation server address as an FQDN, ensure that you configure the DNS server (see Section 4.3.2 on page 23).

b. In the 'Transport Type' drop-down list, select the transport type (**TLS** or **TCP**) for these proxies. For more information on the TLS and TCP transport type configuration, see Section 4.3 on page 21.

c. From the 'Enable Proxy Keep Alive' drop-down list, select **Using Options** to discover whether a particular Mediation server in the cluster is available.

d. From the 'Proxy Load Balancing Method' drop-down list, select **Round Robin** to enable the round robin proxy load-balancing mechanism.

e. From the 'Is Proxy Hot Swap' drop-down list, select **Yes**.

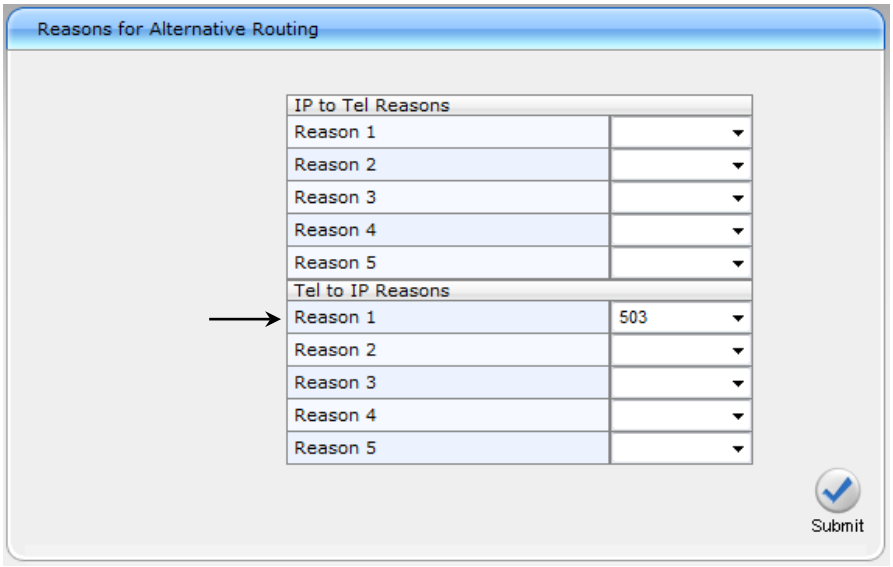
If there is no response from the first Mediation server after a user-defined number of retransmissions, the INVITE message is sent to the redundant Mediation server.

f. Click **Submit** to apply your settings.

3. When the Enhanced Gateway receives a SIP 503 response from the Mediation server in response to an INVITE, it re-sends the INVITE to the redundant Mediation server (located at the datacenter). To achieve this, you need to configure the receipt of a SIP 503 response as a reason for IP alternative routing:

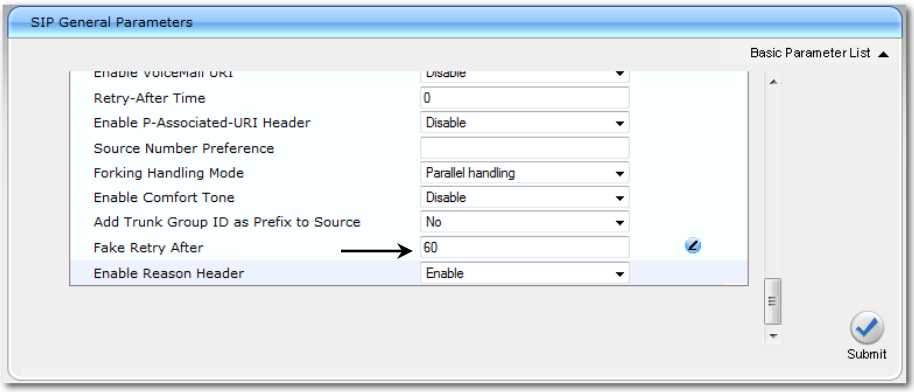
   a. Open the Reasons for Alternative Routing page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Routing** > **Alternative Routing Reasons**).

Figure 4-4: Reasons for Alternative Routing Page



   b. Under the **Tel to IP Reasons** group, from the 'Reason 1' drop-down list, select **503**.
   c. Click **Submit**.
   d. Open the SIP General Parameters page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **General Parameters**).

Figure 4-5: SIP General Parameters Page



   e. In 'Fake Retry After' field, enter the time **60** (in seconds). When the Enhanced Gateway receives a SIP 503 response (from the Mediation server) without a Retry-After header, the Enhanced Gateway behaves as if the 503 response includes a Retry-After header with this user-defined period.
   f. Click **Submit**.
   g. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

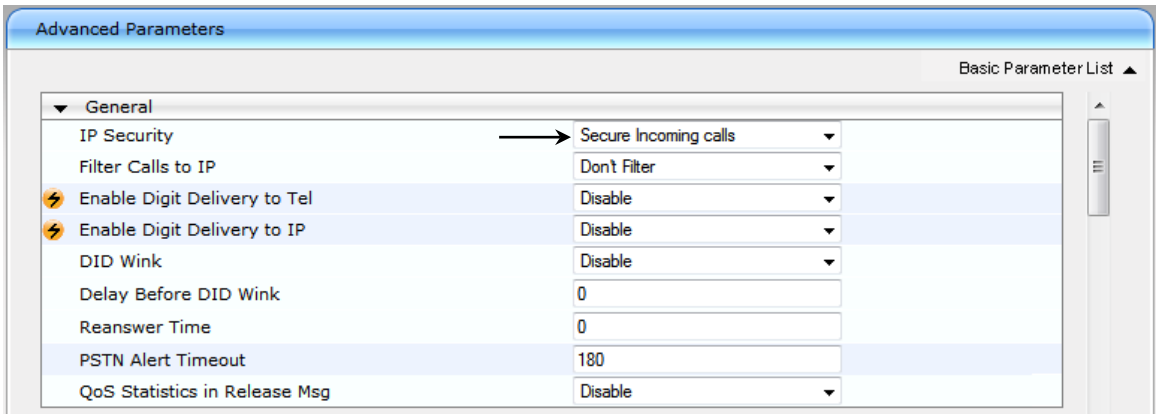
4.2 Step 2: Restricting Communication to Mediation Server Only

The procedure below describes how to restrict IP communication, by allowing communication only between the Enhanced Gateway and the Mediation server. This ensures that the Enhanced Gateway accepts and sends SIP calls **only** to and from the Mediation server (as required by Microsoft). This is done by enabling the IP Security feature and then defining the allowed ("administrative" list) IP addresses (or FQDNs) in the Proxy Set table.

➢ **To allow IP communication only between the Enhanced Gateway and Mediation server:**

1. Open the Advanced Parameters page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **Advanced Parameters**).

Figure 4-6: Advanced Parameters Page



2. From the 'IP Security' drop-down list, select **Secure Incoming calls** to enable the security feature to accept and send SIP calls only from and to user-defined IP addresses or FQDN (i.e., Mediation server) configured in the Proxy Set table (see Step 4.1 on page 17).
3. Click **Submit** to apply your settings.
4. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

4.3 Step 3: Configuring TLS

Transport Layer Security (TLS) is the recommended transport type (enabled by default on Lync environment) for communication between the Enhanced Gateway and the Mediation server. However, if you require TCP instead, then skip this section and proceed to Step 4 (Section 4.4 on page 30).

TLS provides encrypted SIP signaling between the Enhanced Gateway and the Mediation server. When using TLS, you also need to configure the Enhanced Gateway with a certificate for authentication during the TLS handshake with the Mediation server.

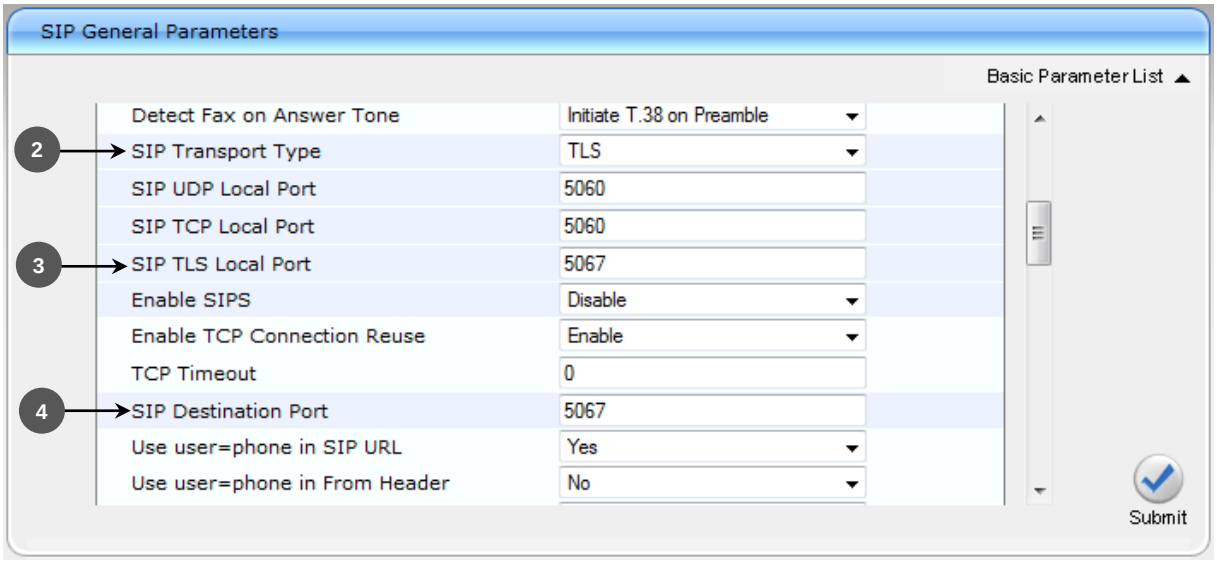
4.3.1 Enabling TLS and Defining TLS Port

The procedure below describes how to enable TLS and configure the Enhanced Gateway ports used for TLS.

➢ **To enable TLS and configure TLS ports:**

1. Open the SIP General Parameters page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **General Parameters**).

Figure 4-7: SIP General Parameters Page



2. From the 'SIP Transport Type' drop-down list, select **TLS**.
3. In the 'SIP TLS Local Port', enter **5067**.This port corresponds to the Mediation server TLS transmitting port configuration.
4. In the 'SIP Destination Port', enter **5067**.This port corresponds to the Mediation server TLS listening port configuration.
5. Click **Submit** to apply your settings.
6. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

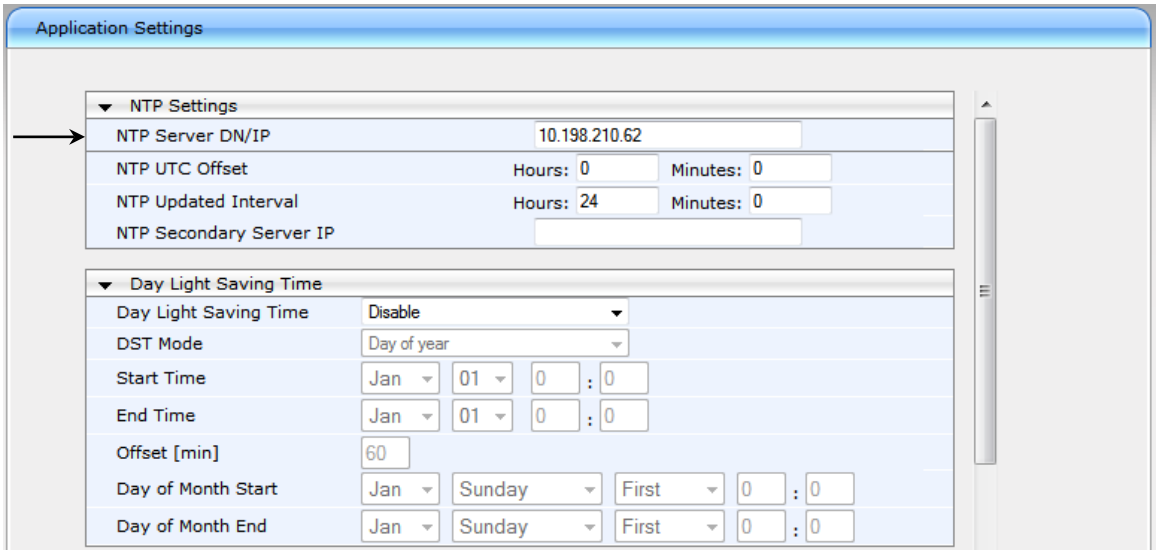
4.3.2 Configuring the NTP Server

The procedure below describes how to configure the Network Time Protocol (NTP) server. This is important for maintaining the correct time and date on the Enhanced Gateway, by synchronizing it with a third-party NTP server. This ensures that the Enhanced Gateway has the same date and time as the Certification Authority (CA), discussed later in Section 4.3.4 on page 21.

➢ **To configure the NTP server:**

1. Open the Application Settings page (**Configuration** tab > **System** menu > **Application Settings**).

Figure 4-8: Application Settings Page



2. In the 'NTP Server IP Address' field, enter the IP address of the NTP server.
3. Click **Submit** to apply your changes.
4. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

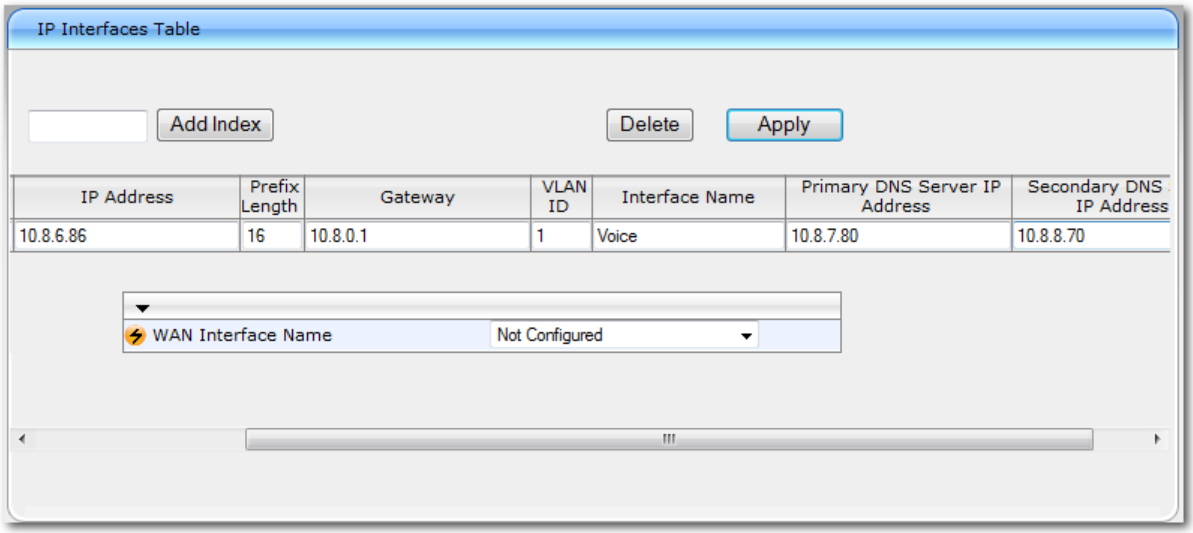
4.3.3 Configuring the DNS Server

The procedure below describes how to configure the IP address of the Domain Name System (DNS) servers. This is required if the Mediation server is configured with an FQDN, in which case, the DNS is used to resolve it into an IP address.

➢ **To configure the DNS servers:**

1. Open the IP Settings page (**Configuration** tab > **VoIP** menu > **Network** > **IP Settings**).

Figure 4-9: DNS Server Settings



2. In the 'DNS Primary Server IP' and 'DNS Secondary Server IP' fields, enter the IP address of the primary and secondary DNS server, respectively.
3. Click **Submit** to apply your changes and then click **Done**.
4. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.
5. On the toolbar, from the **Device Actions** drop-down list, choose **Reset**, and then in the' Maintenance Actions' page, click the **Reset** button; the Enhanced Gateway resets and your settings are saved to the flash memory.

4.3.4 Configuring a Certificate

This step describes how to exchange a certificate with Microsoft Certificate Authority (CA). It is composed of the following steps:

1. Generating a certificate signing request (CSR)
2. Obtaining CA and Trusted Root certificates from Microsoft
3. Installing Microsoft CA and Trusted Root certificates on the Enhanced Gateway

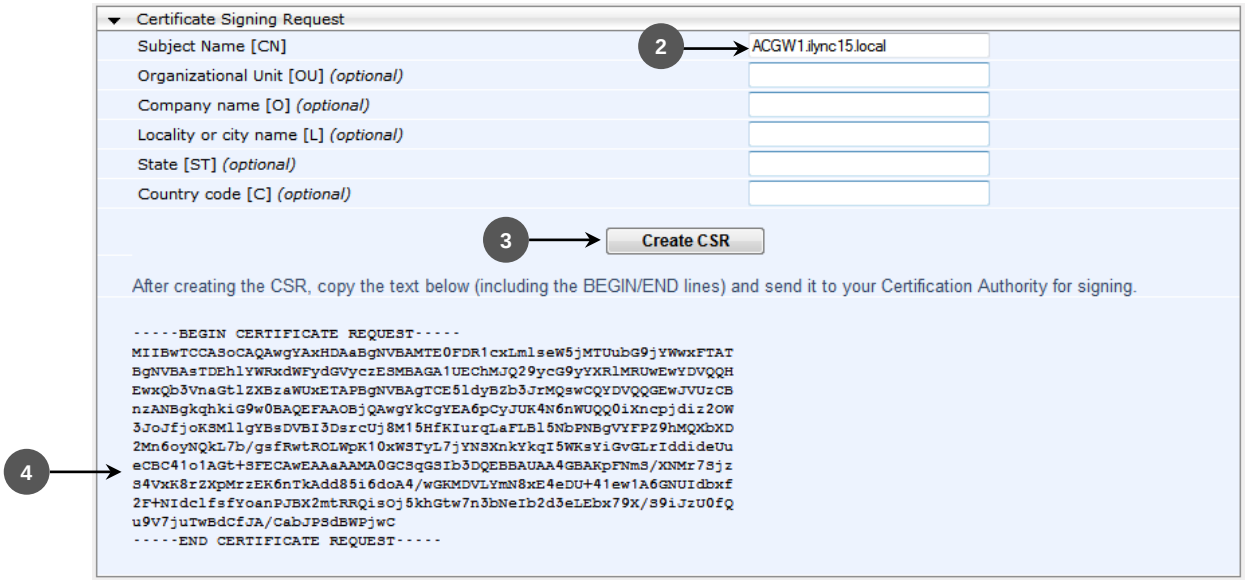
4.3.4.1 Generating a Certificate Signing Request

The procedure below describes how to generate a CSR by the Enhanced Gateway. This CSR is later sent to the Microsoft CA.

➢ **To generate a CSR:**

1. Open the Certificates Signing Request page (**Configuration** tab > **System** menu > **Certificates**).

Figure 4-10: Certificates Page



2. In the Subject Name field, enter the media gateway name (e.g., "ACGW1.ilync15.local"). This name must be equivalent to the gateway name configured in the Topology Builder for Lync Server 2013.
3. Click **Create CSR**; a Certificate request is generated and displayed on the page.
4. Copy the certificate from the line “----BEGIN CERTIFICATE” to “END CERTIFICATE REQUEST----” to a text file (such as Notepad), and then save it to a folder on your PC with the file name *certreq.txt*.

4.3.4.2 Obtaining the Microsoft CA and Trusted Root Certificates

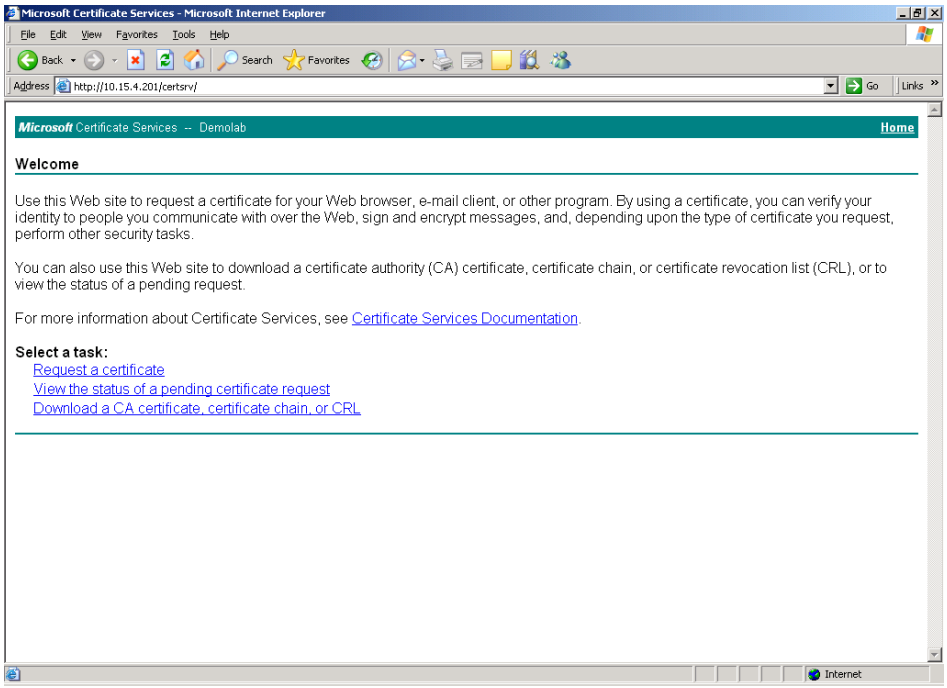
Once you have generated a CSR (described in the previous section), you need to upload it to Microsoft Certificate server and request a CA and trusted root certificates.

➢ **To obtain Microsoft CA and trusted root certificates:**

1. Open a Web browser and then navigate to Microsoft Certificate Services at the following link:

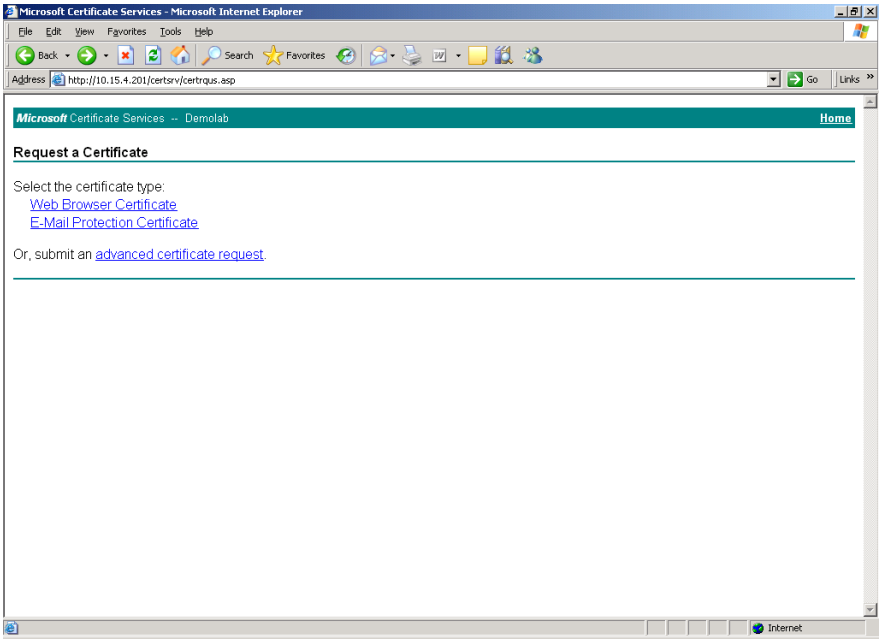
   http://< certificate server address >/certsrv

Figure 4-11: Microsoft Certificate Services Web Page


Microsoft Certificate Services - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://10.15.4.201/certsrv/
Go Links
Microsoft Certificate Services -- Demolab
Home
Welcome
Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.
You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.
For more information about Certificate Services, see Certificate Services Documentation.
Select a task:
Request a certificate
View the status of a pending certificate request
Download a CA certificate, certificate chain, or CRL
Internet

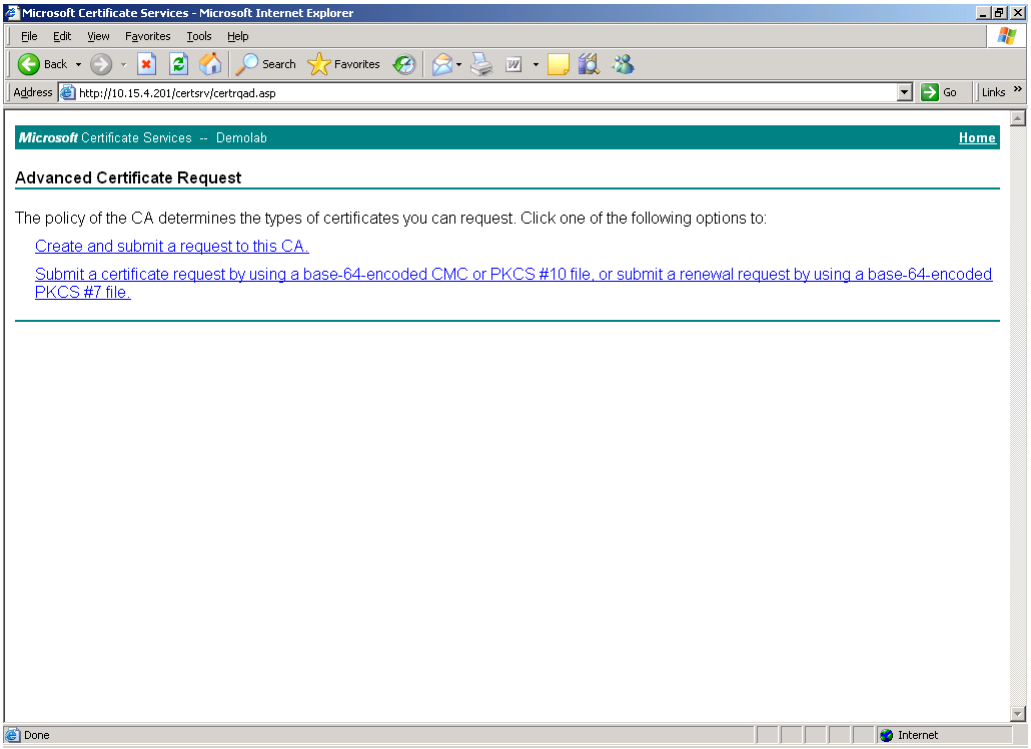
2. Click the **Request a certificate** link; the Request a Certificate page appears:

Figure 4-12: Request a Certificate Page



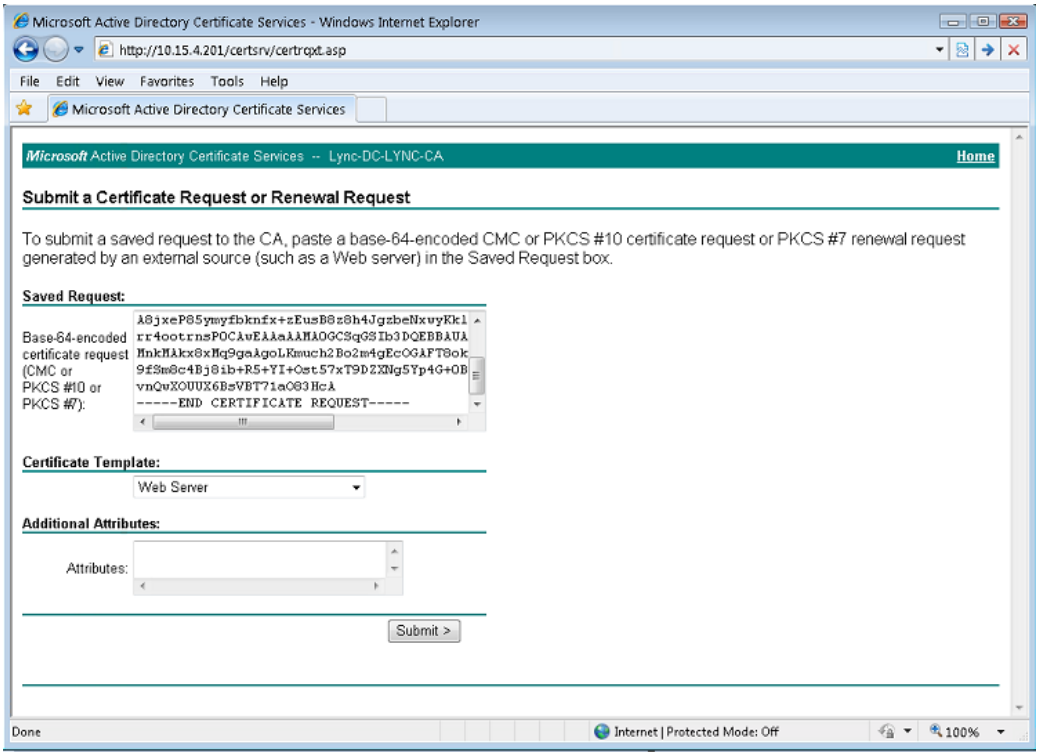
3. Click the **advanced certificate request** link; the Advanced Certificate Request page appears:

Figure 4-13: Advanced Certificate Request Page


Microsoft Certificate Services - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://10.15.4.201/certsrv/certrqad.asp
Go Links
Microsoft Certificate Services -- Demolab
Home
Advanced Certificate Request
The policy of the CA determines the types of certificates you can request. Click one of the following options to:
Create and submit a request to this CA.
Submit a certificate request by using a base-64-encoded CMC or PKCS #10 file, or submit a renewal request by using a base-64-encoded PKCS #7 file.
Done
Internet

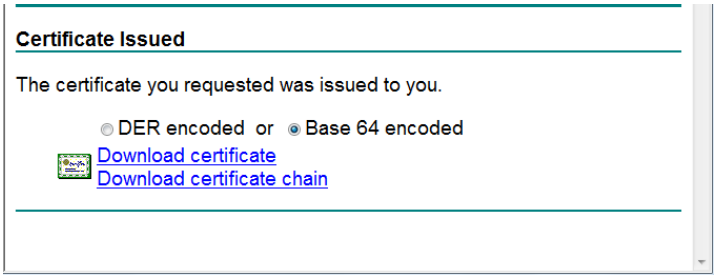
4. Click the **Submit a Certificate request by using base-64-encoded...** link; the Submit a Certificate Request or Renewal Request page appears:

Figure 4-14: Submit a Certificate Request or Renewal Request Page


Microsoft Active Directory Certificate Services - Windows Internet Explorer
http://10.15.4.201/certsrv/certrqxt.asp
File Edit View Favorites Tools Help
Microsoft Active Directory Certificate Services
Microsoft Active Directory Certificate Services -- Lync-DC-LYNC-CA
Home
Submit a Certificate Request or Renewal Request
To submit a saved request to the CA, paste a base-64-encoded CMC or PKCS #10 certificate request or PKCS #7 renewal request generated by an external source (such as a Web server) in the Saved Request box.
Saved Request:
Base-64-encoded certificate request (CMC or PKCS #10 or PKCS #7):
-----END CERTIFICATE REQUEST-----
Certificate Template:
Web Server
Additional Attributes:
Attributes:
Submit >
Done
Internet | Protected Mode: Off
100%

5. Open the CSR file (*certreq.txt*) that you created and saved in Section 4.3.4.1 on page 24, and then copy its contents to the **Saved Request** text box.
6. From the **Certificate Template** drop-down list, select **Web Server**.
7. Click **Submit**; the Certificate Issued Page is displayed:

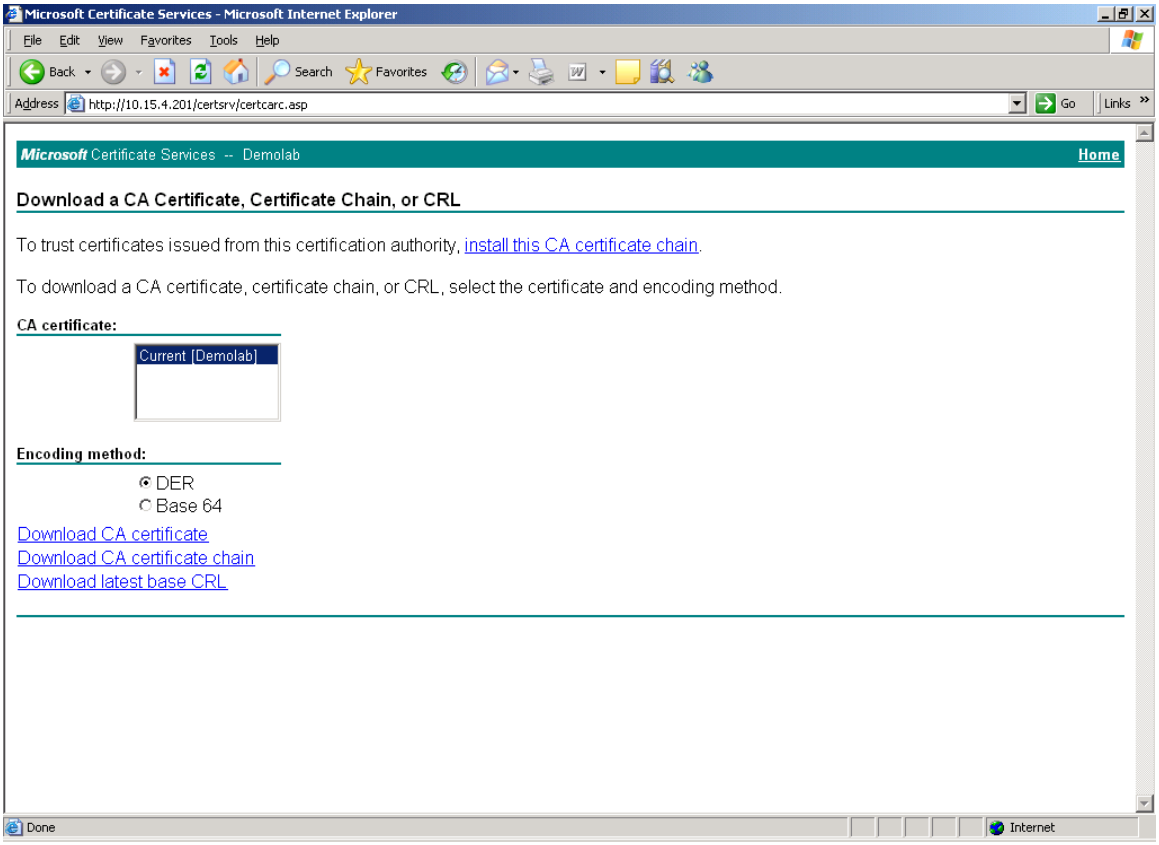
Figure 4-15: Certificate Issued Page


Certificate Issued
The certificate you requested was issued to you.
DER encoded or Base 64 encoded
Download certificate
Download certificate chain

8. Select the **Base 64 encoded** option.
9. Click the **Download CA certificate** link, and then save the file with the name, *gateway.cer* in a folder on your PC.
10. Navigate once again to the certificate server at **http://< certificate server address >/certsrv**.

11. Click the **Download a CA certificate, certificate chain or CRL** link; the Download a CA Certificate, Certificate Chain, or CRL page appears:

Figure 4-16: Download a CA Certificate, Certificate Chain, or CRL Page


Microsoft Certificate Services - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://10.15.4.201/certsrv/certcarc.asp
Go Links
Microsoft Certificate Services -- Demolab
Home
Download a CA Certificate, Certificate Chain, or CRL
To trust certificates issued from this certification authority, install this CA certificate chain.
To download a CA certificate, certificate chain, or CRL, select the certificate and encoding method.
CA certificate:
Current [Demolab]
Encoding method:
DER
Base 64
Download CA certificate
Download CA certificate chain
Download latest base CRL
Done
Internet

12. Under the **Encoding method** group, select the **Base 64** option.
13. Click the **Download CA certificate** link, and then save the file with the name *certroot.cer* in a folder on your PC.

4.3.4.3 Loading Microsoft CA and Trusted Root Certificates to Enhanced Gateway

Once you have obtained the CA and trusted root certificates from Microsoft, you need to load these two certificates to the Enhanced Gateway.

➢ **To load certificates to the Enhanced Gateway:**

1. Open the Certificates Signing Request page (**Configuration** tab > **System** menu > **Certificates**).

Figure 4-17: Certificates Page (Uploading Certificate)

Upload certificate files from your computer
Private key pass-phrase (optional)
audc
Send Private Key file from your computer to the device.
The file must be in either PEM or PFX (PKCS#12) format.
Browse...
Send File
Note: Replacing the private key is not recommended but if it's done, it should be over a physically-secure network link.
2
Send Device Certificate file from your computer to the device.
The file must be in textual PEM format.
Browse...
Send File
3
Send "Trusted Root Certificate Store" file from your computer to the device.
The file must be in textual PEM format.
Browse...
Send File

2. In the 'Device Certificate' field, click **Browse**, select the *gateway.cer* certificate file that you saved on your local disk (see Step 9 in the previous section), and then click **Send File** to upload the certificate to the Enhanced Gateway.
3. In the 'Trusted Root Certificate Store' field, click **Browse** to select the *certroot.cer* certificate file that you saved on your local disk (see Step 13 in the previous section), and then click **Send File** to upload the certificate.
4. On the toolbar, click **Burn** to save the certificates to the Enhanced Gateway flash memory.
5. On the toolbar, from the **Device Actions** drop-down list, choose **Reset**, and then in the Maintenance Actions page, click the **Reset** button; the Enhanced Gateway resets and your settings are saved to the flash memory.

4.4 Step 4: Configuring TCP Transport Type

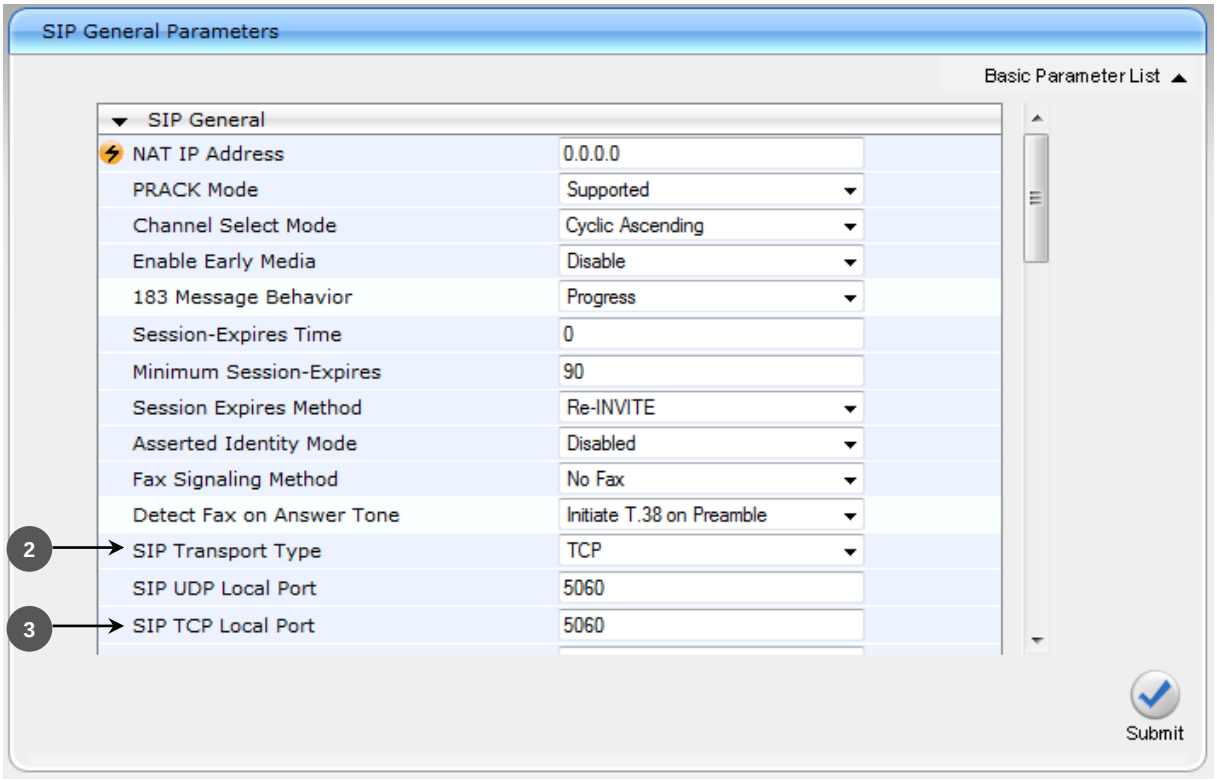
TCP provides unencrypted SIP signaling between the Enhanced Gateway and Mediation server. The procedure below describes how to configure the SIP TCP transport type.

Note: Microsoft does not recommend implementing TCP for the SIP transport type between the Enhanced Gateway and the Mediation server.

➢ **To set SIP transport type to TCP:**

1. Open the SIP General Parameters page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **General Parameters**).

Figure 4-18: SIP General Parameters Page



2. From the 'SIP Transport Type' drop-down list, select **TCP**.
3. In the 'SIP TCP Local Port' field, enter the same Gateway TCP listening port number that was configured on the Topology Builder for the gateway.
4. Click **Submit** to apply your changes.
5. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

4.5 Step 5: Configuring Secure Real-Time Transport Protocol

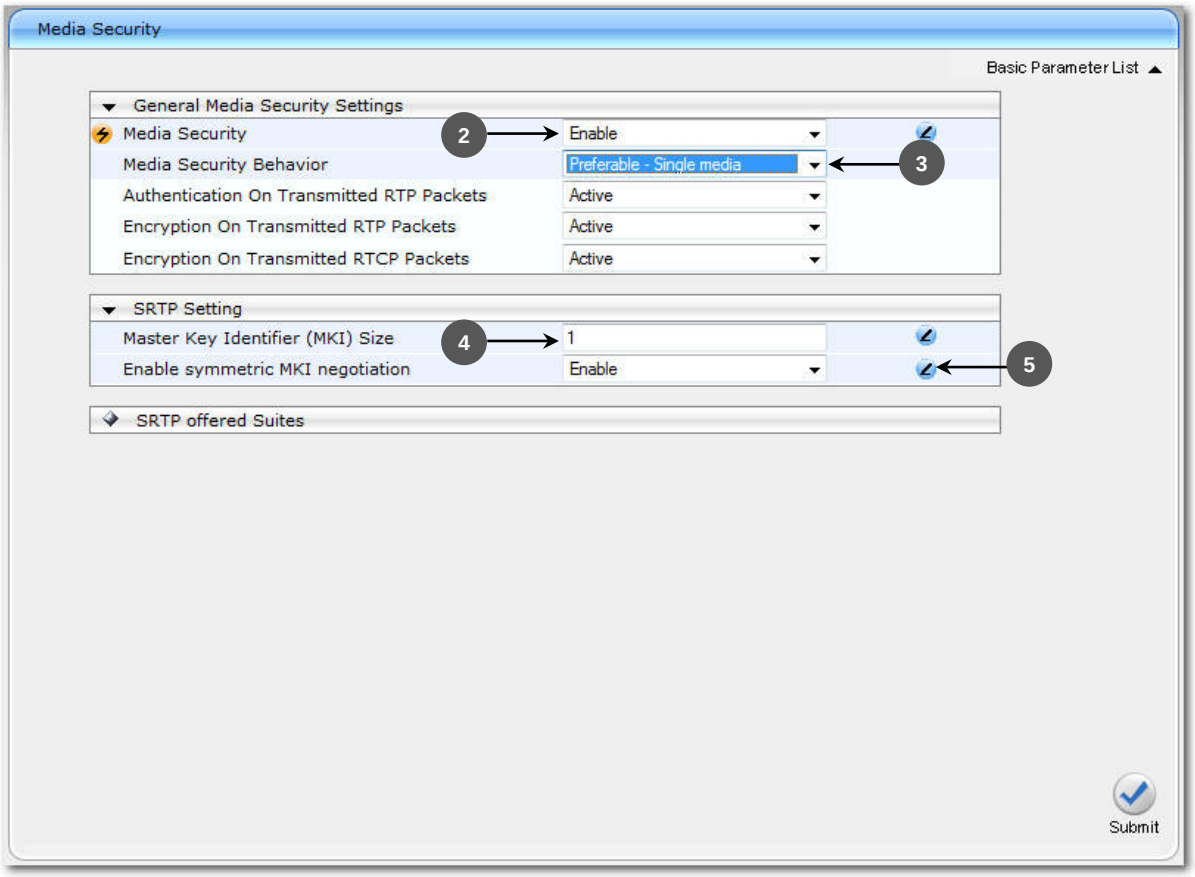
If you configure TLS as the SIP transport type between the Enhanced Gateway and Mediation server, it is recommended to enable Secure RTP (SRTP) encryption and set its mode of operation to one of the following (and that which matches the SRTP supported at the Mediation server):

- **Preferable** (default)**:** The Enhanced Gateway initiates encrypted calls. However, if negotiation of the cipher suite fails, an unencrypted call is established. Incoming calls that don't include encryption information are accepted – **This option is not supported by the Mediation server**.
- **Mandatory:** The Enhanced Gateway initiates encrypted calls, however if negotiation of the cipher suite fails, the call is terminated. Incoming calls that don't include encryption information are rejected.
- **Preferable - Single Media:** The PSTN Gateway sends SDP with a single media ('m=') line only (e.g., m=audio 6000 RTP/AVP 8 0 101) with RTP/AVP and crypto keys. The remote SIP user agent (UA) can respond with SRTP or RTP parameters:
  - If the Mediation Server does not support SRTP, it uses RTP and ignores the crypto lines.
  - If the PSTN Gateway receives an SDP offer with a single media, it responds with SRTP (RTP/SAVP) if the 'Media Security' parameter is set to **Enable**. If SRTP is not supported (i.e., 'Media Security' is set to **Disabled**), it responds with RTP.

➢ **To configure SRTP:**

1. Open the Media Security page (**Configuration** tab > **VoIP** menu > **Media** > **Media Security**).

Figure 4-19: Media Security Page



2. From the 'Media Security' drop-down list, select **Enable** to enable SRTP.
3. From the 'Media Security Behavior' drop-down list, select one of the following:
   - **Mandatory** if the Mediation server is configured to **'**SRTP Required'
   - **Preferable-Single media** if the Mediation server is configured to 'SRTP Optional' or **'**Disable'.
4. In the 'Master Key Identifier (MKI) Size' field, enter **1**. This configures the size (in bytes) of the MKI in SRTP Tx packets.
5. From the 'Enable Symmetric MKI Negotiation' drop-down list, select **Enable**.
6. Click **Submit** to apply your changes.
7. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.
8. On the toolbar, from the 'Device Actions' drop-down list, choose **Reset**, and then in the Maintenance Actions page, click the **Reset** button; the Enhanced Gateway resets and your settings are saved to the flash memory.

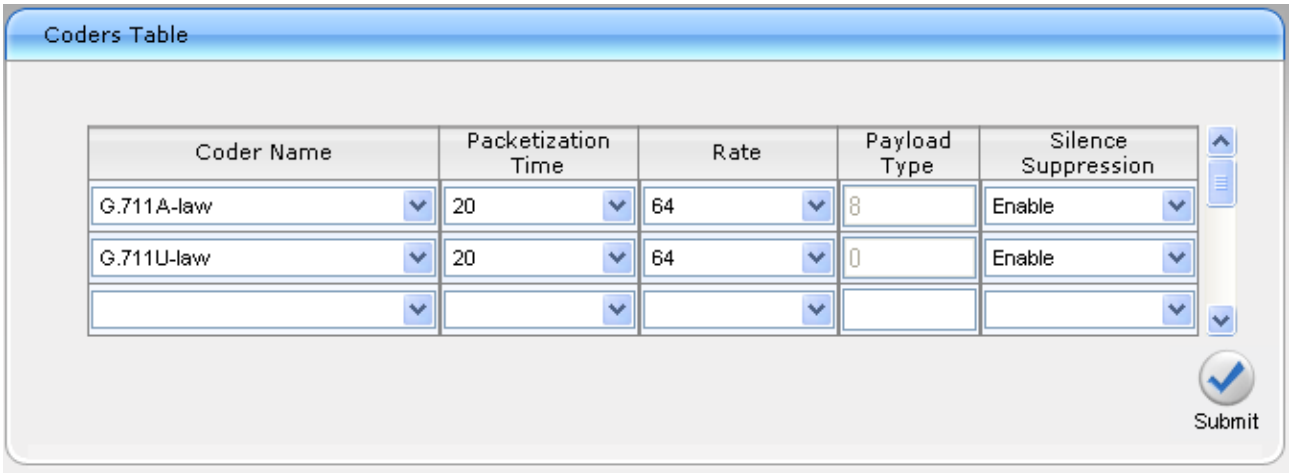
4.6 Step 6: Configuring Voice Coders (with Silence Suppression)

The Enhanced Gateway communicates with the Mediation server using either the G.711 A-law or G.711 μ-law (Mu-Law) voice coder. In addition, silence suppression can be enabled per coder, which is recommended for improving the performance of the Mediation server. The procedure below shows how you can change the default coder.

➢ **To configure the voice coder and silence suppression:**

1. Open the Coders page (**Configuration** tab > **VoIP** menu > **Coders And Profiles** > **Coders**).

Figure 4-20: Coders Table Page



2. From the 'Coder Name' drop-down list, select the required coder.
3. From the 'Silence Suppression' drop-down list, select **Enable**.
4. Click **Submit**.
5. On the toolbar, click **Burn** to save the certificates to the Enhanced Gateway flash memory.

4.7 Step 7: Configuring Comfort Noise and Gain Control

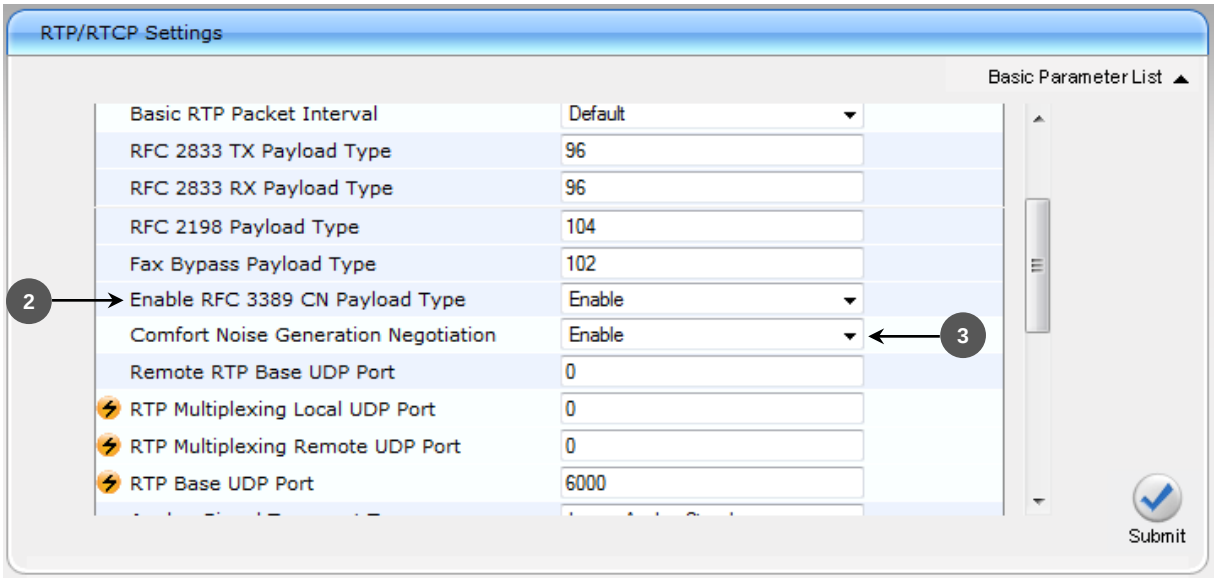
The Microsoft Lync network provides high voice quality by implementing suppression of typing noise during calls and improved generation of "comfort noise," which reduces hissing and smoothes over the discontinuous flow of audio packets. You may need to configure the Enhanced Gateway to match these voice quality features, by enabling silence suppression, comfort noise generation, automatic gain control (AGC), and echo canceller (enabled by default).

Note: Silence suppression is configured per coder type, as described in Step 6 (See Section 4.6 on page 33).

➢ **To configure voice quality:**

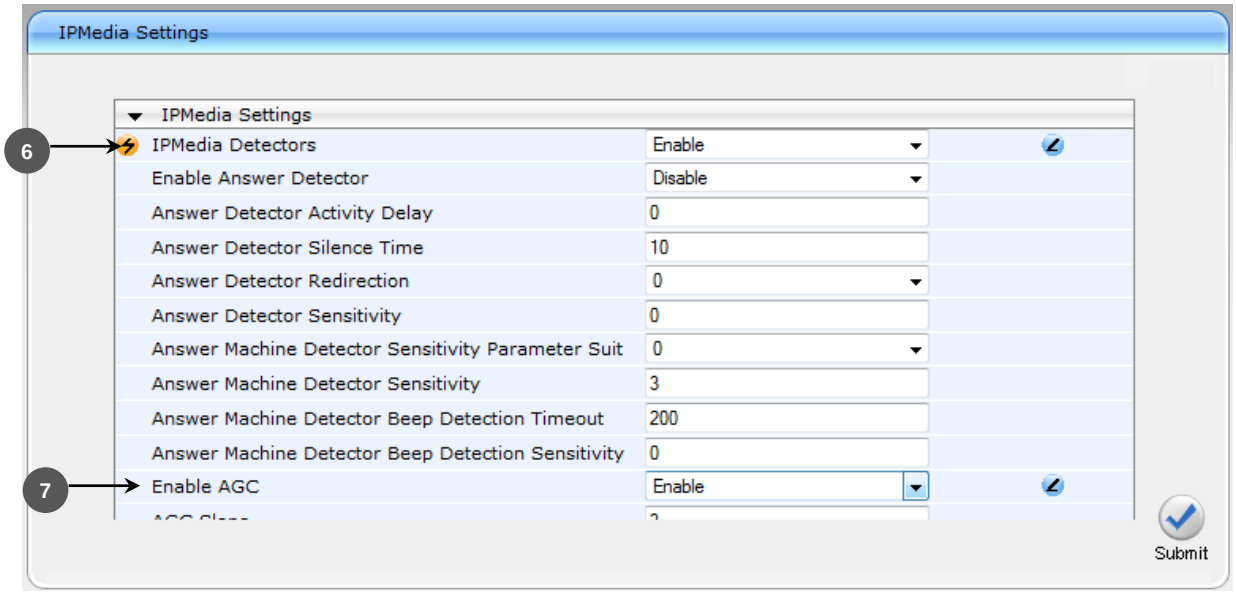
1. Open the RTP/RTCP Settings page (**Configuration** tab > **VoIP** menu > **Media** > **RTP/RTCP Settings**).

Figure 4-21: RTP/RTCP Settings Page



2. Verify that the 'Enable RFC 3389 CN payload Type' parameter is set to **Enable**.
3. From the 'Comfort Noise Generation Negotiation' drop-down list, select **Enable** to enable comfort noise generation.
4. Click **Submit**.
5. Open the IPMedia Settings page (**Configuration** tab > **VoIP** menu > **Media** > **IPMedia Settings**).

Figure 4-22: IPMedia Settings Page



6. From the 'IPMedia Detectors' drop-down list, select **Enable**. This parameter requires an Enhanced Gateway reset (see below).
7. From the 'Enable AGC' drop-down list, select **Enable**.
8. Click **Submit** to apply your changes.
9. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.
10. On the toolbar, from the 'Device Actions' drop-down list, choose **Reset**, and then in the Maintenance Actions page, click the **Reset** button; the Enhanced Gateway resets and your settings are saved to the flash memory.

4.8 Step 8: Configuring Early Media

Early media refers to audio and video that is exchanged before a call is accepted by the recipient. Early media generated by the caller includes voice commands or dual-tone multi frequency (DTMF) tones to activate interactive voice response (IVR) systems. Early media generated by the call recipient include ringback tones, announcements, and requests for input.

Enhanced early media support in Microsoft Lync 2013 enables a caller to hear a ringback tone generated by the call recipient's mobile phone. This is also the case in team-call scenarios, where a call is routed to two team members, one of whom has configured simultaneous ringing for their mobile device.

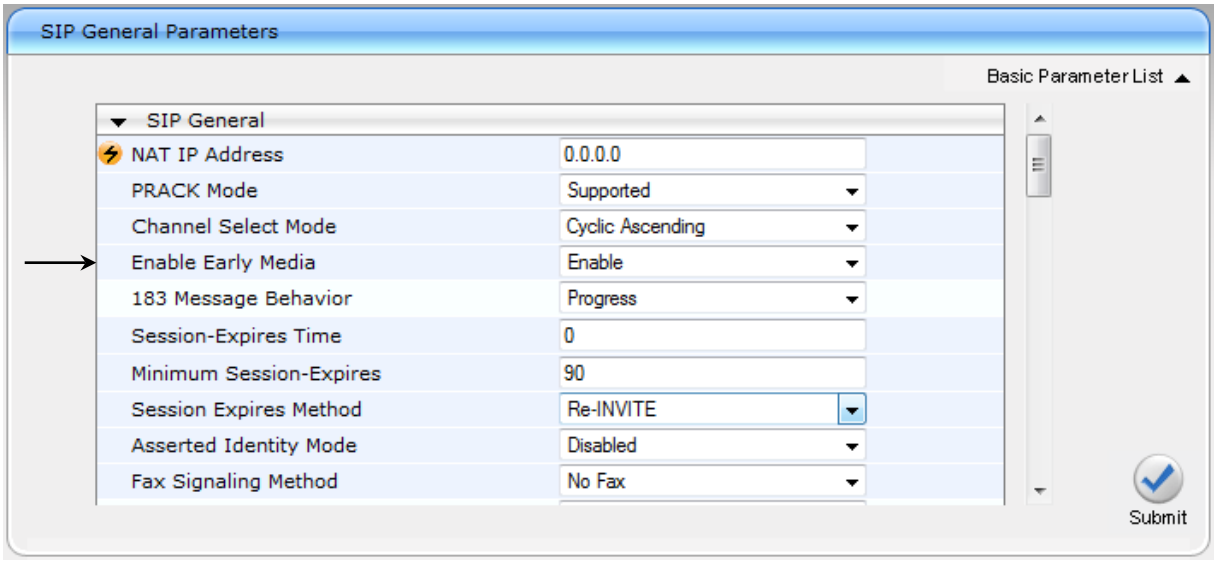
According to Microsoft Lync 2013 requirements, the Enhanced Gateway must send a SIP 183 with SDP response immediately after it receives an INVITE. The RTP packets however, will not be sent until the Enhanced Gateway receives an ISDN Progress, Alerting and Progress Indicator or Connect message. For example, if the Enhanced Gateway receives ISDN Progress, it starts sending RTP packets according to initial negotiation; however there is no need to re-send the 183 response.

You may optionally configure the Enhanced Gateway's early media feature to support the Microsoft Lync 2013 enhanced early media feature.

➢ **To configure the Early Media feature:**

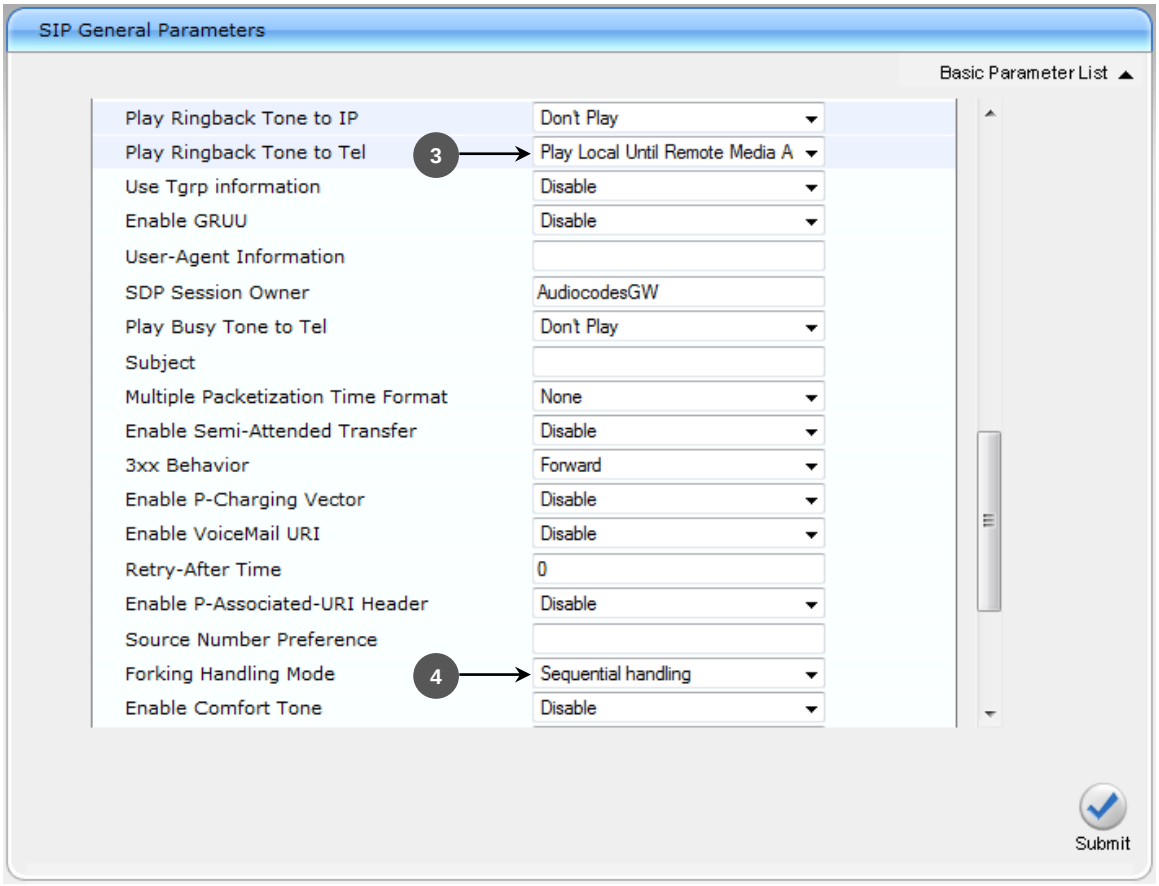
1. Open the General Parameters page (**Configuration** tab > **VoIP** menu > **SIP Definitions** > **General Parameters**).

Figure 4-23: SIP General Parameters Page (1)



2. From the 'Enable Early Media' drop-down list, select **Enable**.

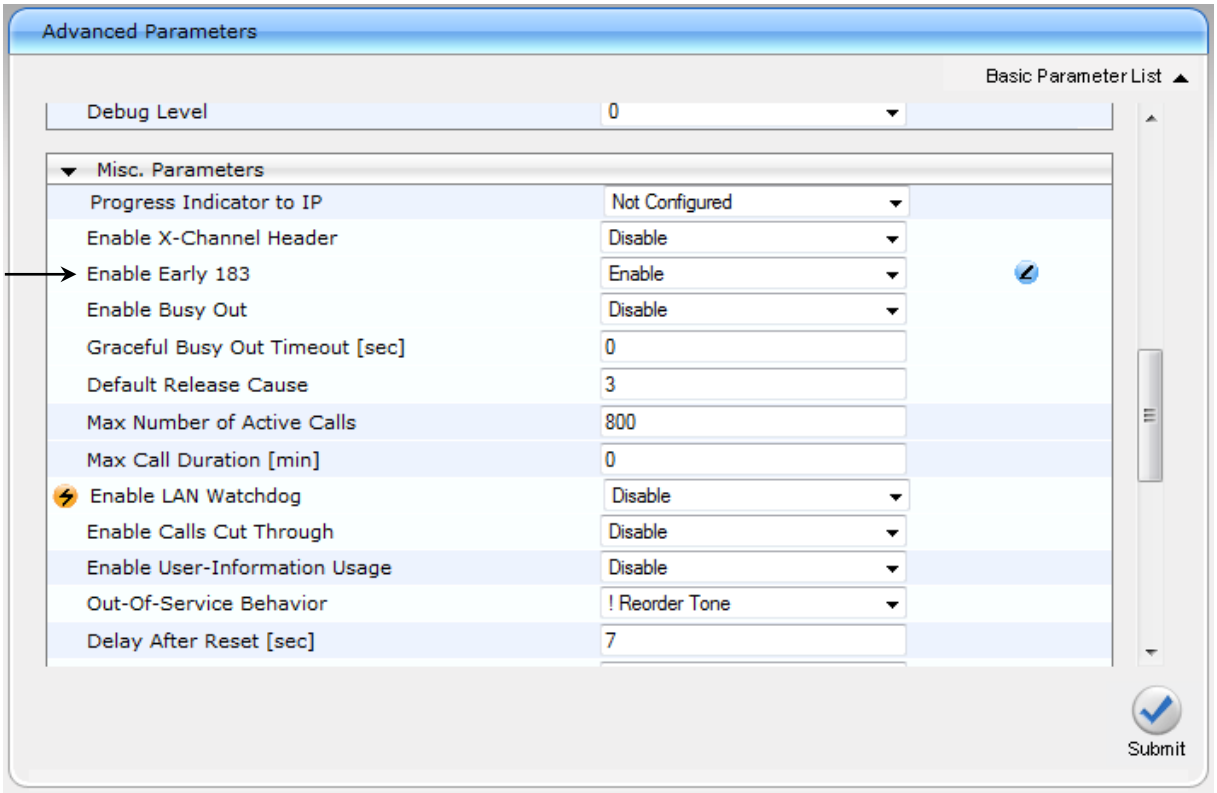
Figure 4-24: SIP General Parameters Page (2)



3. From the 'Play Ringback Tone to Tel' drop-down list, select **Play Local Until Remote Media Arrive**.

   If a SIP 180 response is received and the voice channel is already open (due to a previous 183 early media response or due to an SDP in the current 180 response), the Enhanced Gateway plays a local ringback tone if there are no prior received RTP packets. The Enhanced Gateway stops playing the local ringback tone as soon as it starts receiving RTP packets. At this stage, if the Enhanced Gateway receives additional 18x responses, it does not resume playing the local ringback tone.
4. **From** the 'Forking Handling Mode' drop-down list, select **Sequential handling**. The PSTN Gateway re-opens the stream according to subsequently received 18x responses with SDP, or plays a ringback tone if 180 response without SDP is received.
5. Click **Submit** to apply your changes.
6. Open the Advanced Parameters page (**Configuration tab** > **VoIP** menu > **SIP Definitions** > **Advanced Parameters**).

Figure 4-25: Advanced Parameters Page



7. From the 'Enable Early 183' drop-down list, select **Enable**.
8. Click **Submit** to apply your changes.
9. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

4.9 Step 9: Configuring PSTN Trunks

This section describes how to configure PRI (i.e., E1/T1) or BRI trunks connected to the Enhanced Gateway.

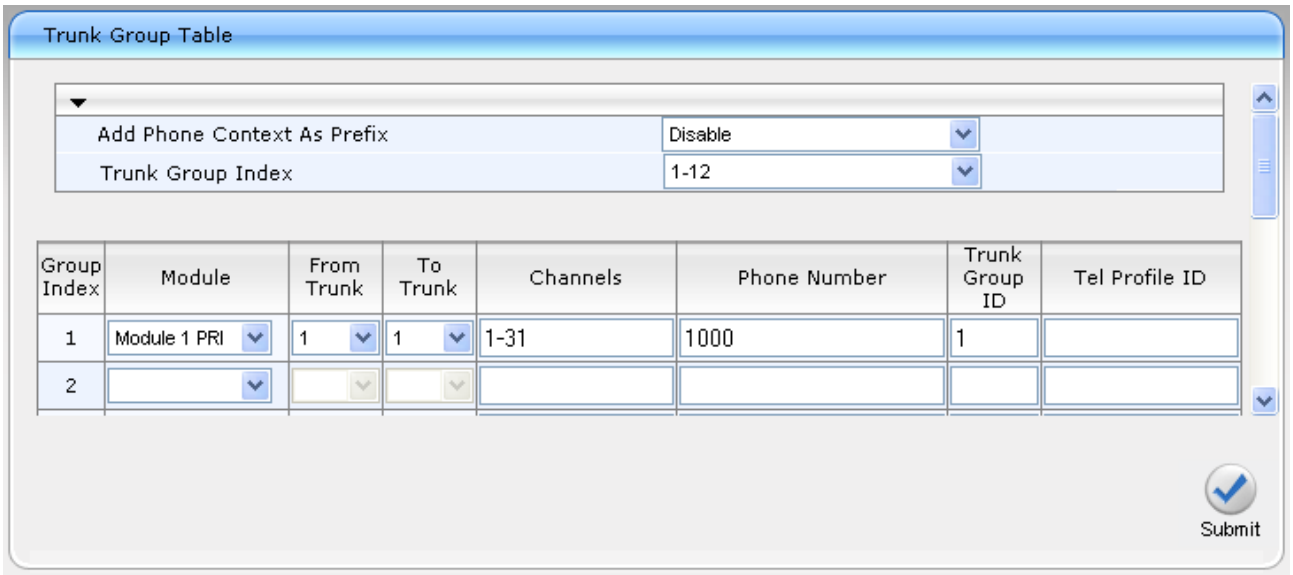
4.9.1 Enabling Trunks

To enable trunks, you need to assign them to Trunk Groups, as described below.

➢ **To enable trunks:**

1. Open the Trunk Group Table page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Trunk Group** > **Trunk Group**).

Figure 4-26: Trunk Group Table Page



2. In the 'Module' column, select the module number and type (e.g., PRI) on which the trunks are located.
3. In the 'From Trunk' and 'To Trunk' columns, select the physical trunk range.
4. In the 'Channel(s)' column, enter the B-channels (e.g., 1-31) that you want to enable.
5. In the 'Phone Number' column, enter the phone number (e.g., 1000) for the first channel; phone numbers 1001, 1002, 1003, and so on are sequentially assigned to subsequent channels. Note that these numbers are used internally.
6. In the 'Trunk Group ID' column, enter the ID for the Trunk Group.
7. Click **Submit** to apply your changes.
8. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

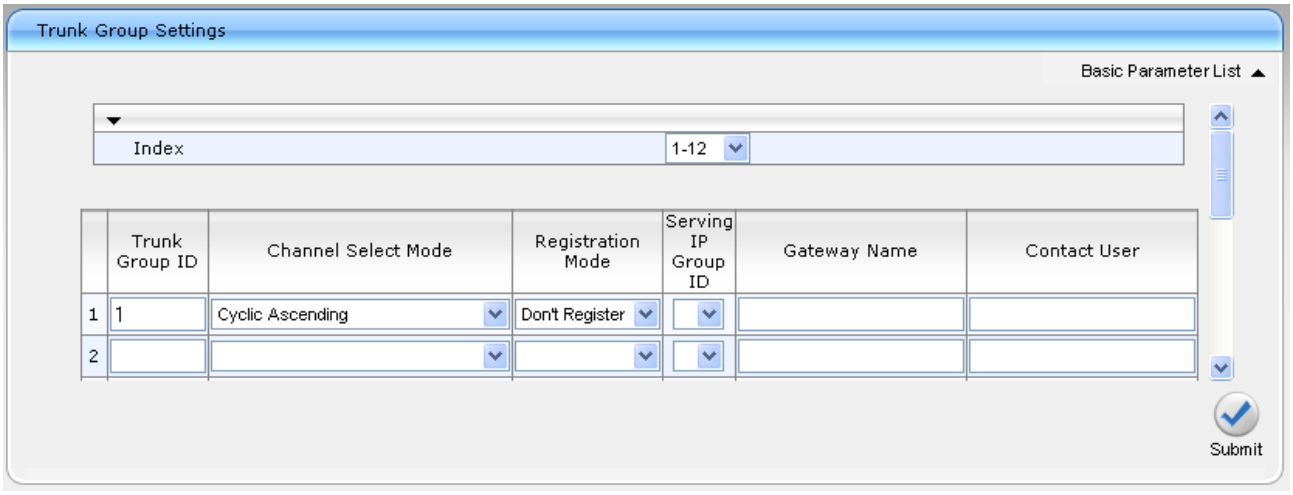
4.9.2 Configuring the Channel Select Method

Once you have enabled the trunks and assigned them to Trunk Groups, you need to configure the method for which IP-to-Tel calls are assigned to channels within the Trunk Group.

➢ **To configure the channel select mode:**

1. Open the Trunk Group Settings page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Trunk Group** > **Trunk Group Settings**).

Figure 4-27: Trunk Group Settings Page



2. In the 'Trunk Group ID' column, enter the Trunk Group ID that you want to configure.
3. From the 'Channel Select Mode' drop-down list, select the method for which IP-to-Tel calls are assigned to channels pertaining to the Trunk Group (i.e. Cyclic Ascending).
4. From the 'Registration Mode' drop-down list, select **Don't Register**.
5. Click **Submit** to apply your changes.
6. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

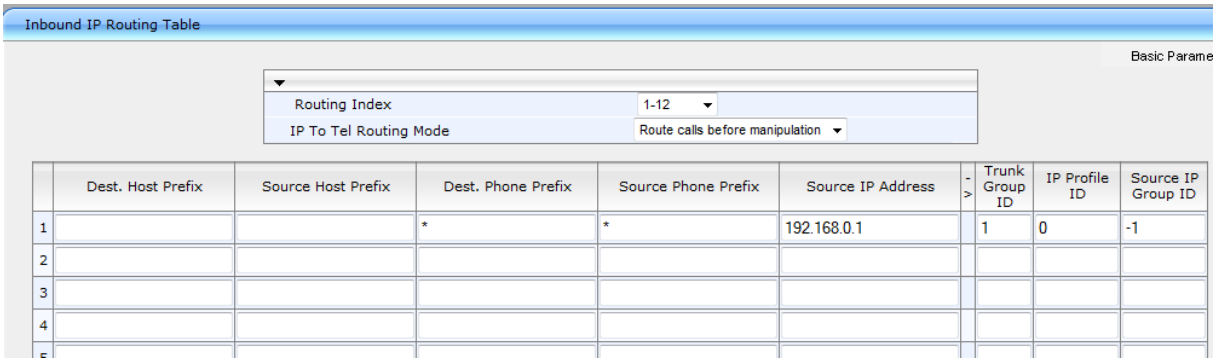
4.9.3 Configuring IP-to-Trunk Group Routing

The procedure below describes how to configure an IP-to-Trunk Group routing rule, whereby all calls from the Mediation server to any destination phone number is routed to Trunk Group 1 (that you configured in Section 4.9.1 on page 39).

➢ **To configure an IP-to-Trunk Group routing rule:**

1. Open the Inbound IP Routing Table page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Routing** > **IP to Trunk Group Routing**).

Figure 4-28: Inbound IP Routing Table Page



2. In the first table entry row, enter the asterisk (*) sign in the 'Dest. Phone Prefix' and 'Source Phone Prefix' fields.
3. In the 'Source IP Address' field, enter the IP address of the Mediation server.
4. In the 'Trunk Group ID' field, enter the Trunk Group to where the calls must be routed.
5. Click **Submit** to apply your changes.
6. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

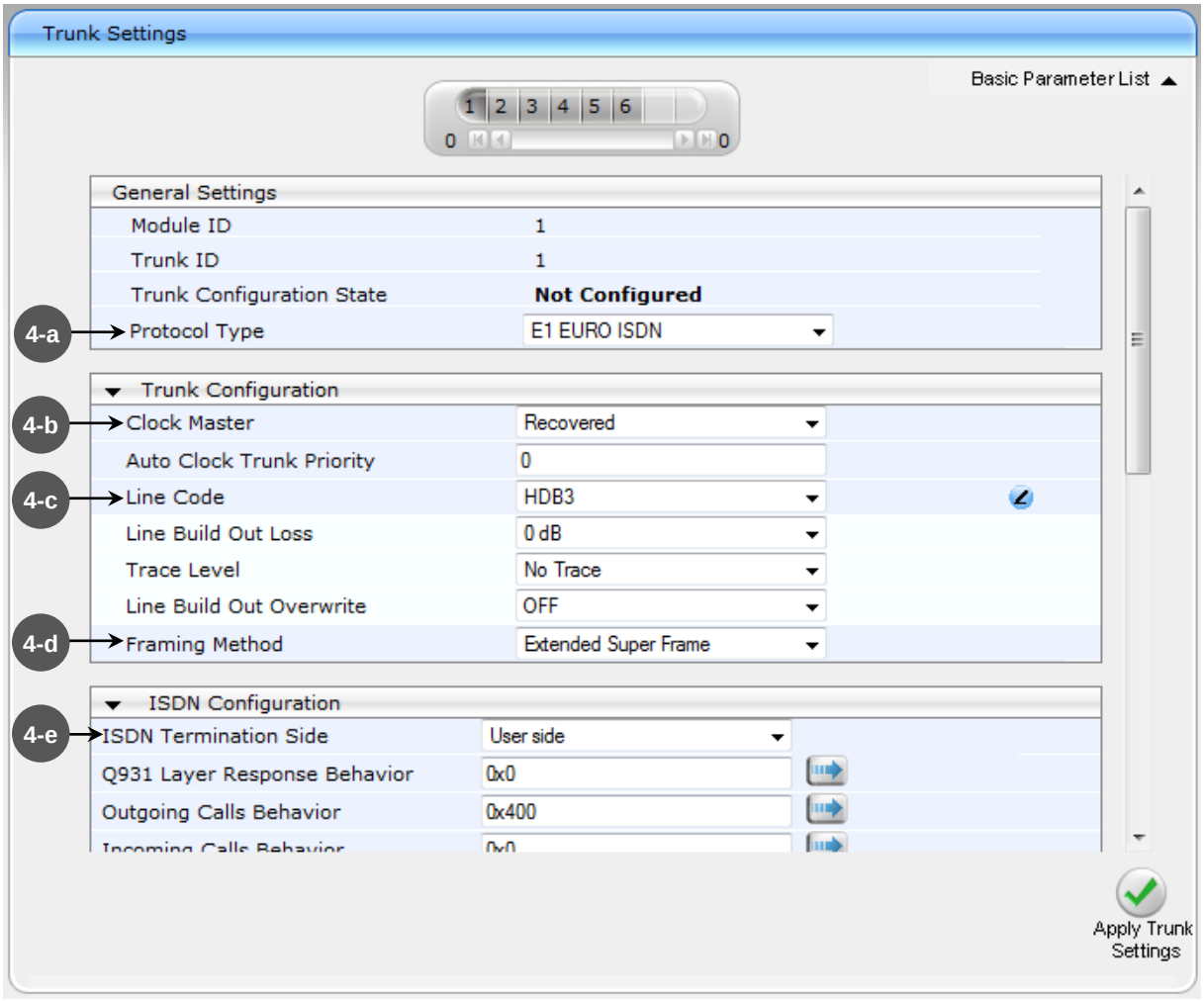
4.9.4 Configuring the Trunk

The procedure below describes basic configuration of the physical trunk.

➢ **To configure the physical trunk:**

1. Open the Trunk Settings page (**Configuration** tab > **VoIP** menu > **PSTN** > **Trunk Settings**).

Figure 4-29: Trunk Settings Page


Trunk Settings
Basic Parameter List
1 2 3 4 5 6
0 0
General Settings
Module ID 1
Trunk ID 1
Trunk Configuration State Not Configured
4-a Protocol Type E1 EURO ISDN
Trunk Configuration
4-b Clock Master Recovered
Auto Clock Trunk Priority 0
4-c Line Code HDB3
Line Build Out Loss 0 dB
Trace Level No Trace
Line Build Out Overwrite OFF
4-d Framing Method Extended Super Frame
ISDN Configuration
4-e ISDN Termination Side User side
Q931 Layer Response Behavior 0x0
Outgoing Calls Behavior 0x400
Apply Trunk Settings

2. On the top of the page, a bar with trunk number icons displays the status of each trunk:
   - Grey - disabled
   - Green - active
   - Yellow - RAI alarm
   - Red - LOS / LOF alarm
   - Blue - AIS alarm
   - Orange - D-channel alarm (ISDN only)

   Select the Trunk that you want to configure, by clicking the desired trunk number icon.
3. If the trunk is new, configure the trunk as required. If the trunk was previously configured, click the **Stop Trunk** button to de-activate the trunk.

4. Basic trunk configuration:
   a. From the 'Protocol Type' drop-down list, select the required trunk protocol.

Notes:

- If the 'Protocol Type' field displays 'NONE' (i.e., no protocol type selected) and no other trunks have been configured, after selecting a PRI protocol type, you must reset the Enhanced Gateway.
- All PRI trunks of the Enhanced Gateway must be of the same line type - E1 or T1. However, different variants of the same line type can be configured on different trunks, for example, E1 Euro ISDN and E1 CAS (subject to the constraints in the Release Notes).
- BRI trunks can operate with E1 or T1 trunks.
- If the trunk can't be stopped because it provides the clock (assuming the Enhanced Gateway is synchronized with the E1/T1 clock), assign a different E1/T1 trunk to provide the clock or enable 'TDM Bus PSTN Auto Clock' in the 'TDM Bus Settings' page (see Section 4.9.5 on page 44).
- To delete a previously configured trunk, set the parameter 'Protocol Type' to **None**.

   b. From the 'Clock Master' drop-down list, select the trunk's clock source:
      - **Recovered:** clock source is recovered from the trunk.
      - **Generated:** clock source is provided by the internal TDM bus clock source (according to the parameter 'TDM Bus Clock Source' – see Section 4.9.5 on page 44).
   c. From the 'Line Code' drop-down list, select the line code:
      - **B8ZS** (bipolar 8-zero substitution) for T1 trunks only
      - **HDB3** (high-density bipolar 3) for E1 trunks only
      - **AMI** (for E1 and T1)
   d. From the 'Framing Method' drop-down list, select the required framing method. For E1 trunks always set this parameter to **Extended Super Frame**.
   e. To configure whether the trunk is connected to the PBX is User or Network side, from the 'ISDN Termination' drop-down list, select **User side** or **Network side**.
5. Continue configuring the trunk according to your requirements.
6. When you have completed configuration, click the **Apply Trunk Settings** button to apply the changes to the selected trunk.
7. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.
8. On the toolbar, from the 'Device Actions' drop-down list, choose **Reset**, and then in the Maintenance Actions page, click the **Reset** button; the Enhanced Gateway resets and your settings are saved to the flash memory.

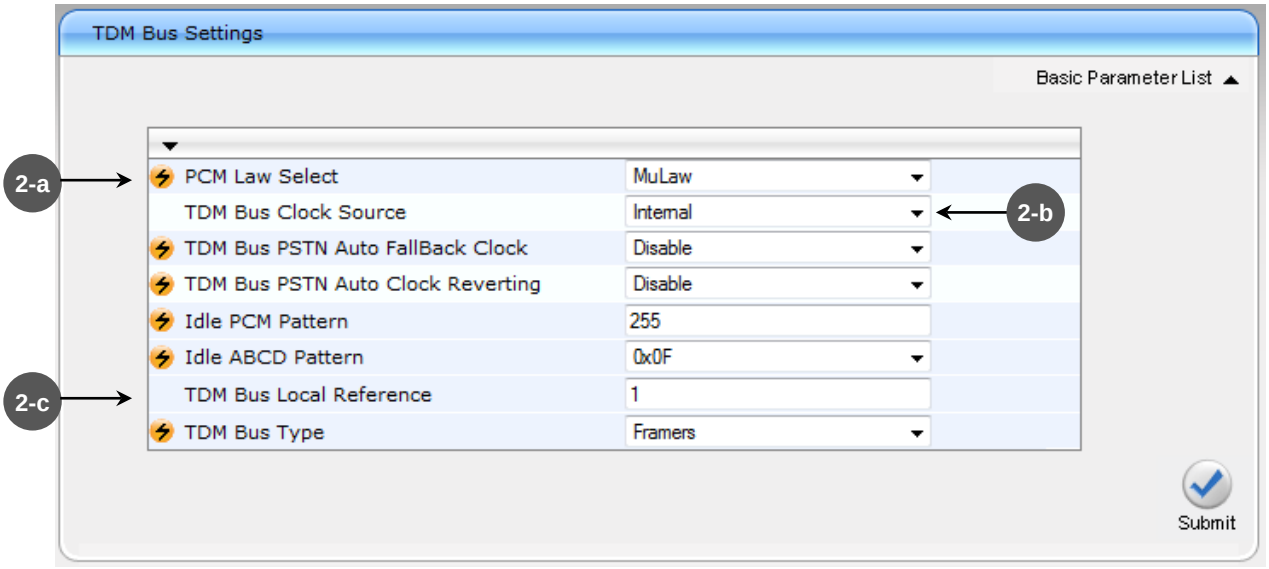
4.9.5 Configuring the TDM Bus

The procedure below describes how to configure the TDM bus of the Enhanced Gateway.

➢ **To configure the TDM bus:**

1. Open the TDM Bus Settings page (**Configuration** tab > **VoIP** menu > **TDM** > **TDM Bus Settings**).

Figure 4-30: TDM Bus Settings Page



2. Configure the TDM bus parameters according to your deployment requirements. Below is a description of some of the main TDM parameters:
   a. **PCM Law Select:** defines the type of PCM companding law in the input/output TDM bus. Typically, A-Law is used for E1 and Mu-Law for T1/J1.
   b. **TDM Bus Clock Source:** defines the clock source to which the Enhanced Gateway synchronizes - generate clock from local source (Internal) or recover clock from PSTN line (Network).
   c. **TDM Bus Local Reference:** defines the physical trunk ID from which the Enhanced Gateway recovers (receives) its clock synchronization when the TDM Bus Clock Source is configured to recover the clock from the PSTN line.
3. Click **Submit** to apply your changes.
4. On the toolbar, click **Burn** to save the settings to the Enhanced Gateway flash memory.
5. On the toolbar, from the 'Device Actions' drop-down list, choose **Reset**, and then in the Maintenance Actions page, click the **Reset** button; the Enhanced Gateway resets and your settings are saved to the flash memory.

4.10 Step 10: Configuring Normalization Rules for E.164 Format for PBX/PSTN Connectivity

Microsoft Lync 2013 implements the standard E.164 format, while the PBX or PSTN implements other number formats for dialing. If the Enhanced Gateway is connected to a PBX or directly to the PSTN, the Enhanced Gateway may need to perform number manipulations for the called and/or calling number to match the PBX or PSTN dialing rules or to match Microsoft Lync 2013 E.164 format.

Therefore, the Enhanced Gateway must be configured with manipulation rules to translate (i.e., normalize) numbers dialed in standard E.164 format to various formats, and vice versa. Manipulation needs to be done for outbound calls (i.e., calls received from Microsoft Lync clients through Microsoft Lync 2013) and inbound calls (i.e., calls destined to Lync clients).

Number manipulation (and mapping of NPI/TON to SIP messages) rules are configured in the following Manipulation tables:

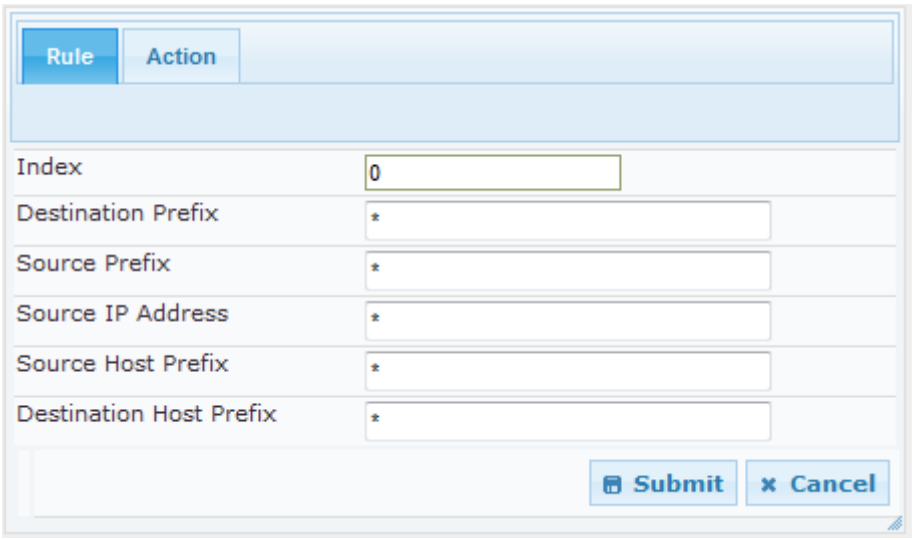
- **For Tel-to-IP calls:**
  - Destination Phone Number Manipulation Table for Tel-to-IP Calls
  - Source Phone Number Manipulation Table for Tel-to-IP Calls
- **For IP-to-Tel calls:**
  - Destination Phone Number Manipulation Table for IP-to-Tel Calls
  - Source Phone Number Manipulation Table for IP-to-Tel Calls

Number manipulation configuration examples are provided for inbound and outbound calls in Section 4.10.1.

➢ **To configure number manipulation rules:**

1. Open the required Number Manipulation page (**Configuration** tab > **VoIP** menu > **GW and IP to IP** > **Manipulations** > **Dest Number IP -> Tel** or **Dest Number Tel -> IP**, **Source Number IP -> Tel**, or **Source Number Tel -> IP**); the relevant Manipulation table page is displayed.
2. Click the **Add** button; the following dialog box is displayed:

Figure 4-31: Number Manipulation Table - Add Dialog Box



3. Click the **Rule** tab, and then configure the matching characteristics. For a description of the parameters, see the table below.
4. Click the **Action** tab, and then configure the manipulation operation. For a description of the parameters, see the table below.

5. Click **Submit** to apply your changes.
6. On the toolbar, click **Burn** to save the changes to the Enhanced Gateway flash memory.

Table 4-1: Number Manipulation Parameters Description

Parameter	Description
Matching Characteristics (Rule)	
Destination Prefix	Defines the destination (called) telephone number prefix and/or suffix. You can use special notations for denoting the prefix. For example, **[100-199](100,101,105)** denotes a number that starts with 100 to 199 and ends with 100, 101 or 105. You can also use the $ sign to denote calls without a called number.
Source Prefix	Defines the source (calling) telephone number prefix and/or suffix. You can use special notations for denoting the prefix. For example, **[100-199](100,101,105)** denotes a number that starts with 100 to 199 and ends with 100, 101 or 105. You can also use the $ sign to denote calls without a calling number.
Source IP Address	Defines the source IP address of the caller. This is obtained from the Contact header in the INVITE message. **Notes:** ▪ This parameter is applicable only to the number manipulation tables for IP-to-Tel calls. ▪ The source IP address can include the 'x' wildcard to represent single digits. For example: 10.8.8.xx represents all IP addresses between 10.8.8.10 to 10.8.8.99. ▪ The source IP address can include the asterisk (*) wildcard to represent any number between 0 and 255. For example, 10.8.8.* represents all IP addresses between 10.8.8.0 and 10.8.8.255.
Source Host Prefix	Defines the URI host name prefix of the incoming SIP INVITE message in the From header. **Notes:** ▪ This parameter is applicable only to the number manipulation tables for IP-to-Tel calls. ▪ The asterisk (*) wildcard can be used to denote any prefix. ▪ If the P-Asserted-Identity header is present in the incoming INVITE message, then the value of this parameter is compared to the P-Asserted-Identity URI host name (instead of the From header).
Destination Host Prefix	Defines the Request-URI host name prefix of the incoming SIP INVITE message. **Notes:** ▪ This parameter is applicable only to the number manipulation tables for IP-to-Tel calls. ▪ The asterisk (*) wildcard can be used to denote any prefix.

Parameter	Description
Source Trunk Group	Defines the source Trunk Group ID for Tel-to-IP calls. To denote all Trunk Groups, leave this field empty. **Notes:** ▪ The value -1 indicates that this field is ignored in the rule. ▪ This parameter is applicable only to the number manipulation tables for Tel-to-IP calls. ▪ For IP-to-IP call routing, this parameter is not required (i.e., leave the field empty).
Source IP Group	Defines the IP Group from where the IP call originated. Typically, the IP Group of an incoming INVITE is determined or classified using the Inbound IP Routing Table. If not used (i.e., any IP Group), leave the field empty. **Notes:** ▪ The value -1 indicates that this field is ignored. ▪ This parameter is applicable only to the number manipulation tables for Tel-to-IP calls. ▪ If this Source IP Group has a Serving IP Group, then all calls from this Source IP Group are sent to the Serving IP Group. In this scenario, this table is used only if the 'PreferRouteTable' parameter is set to 1.
Destination IP Group	Defines the IP Group to where the call is sent. **Notes:** ▪ The value -1 indicates that this field is ignored. ▪ This parameter is applicable only to the Destination Phone Number Manipulation Table for Tel -> IP Calls.
Operation (Action)	
Stripped Digits From Left	Defines the number of digits to remove from the left of the telephone number prefix. For example, if you enter 3 and the phone number is 5551234, the new phone number is 1234.
Stripped Digits From Right	Defines the number of digits to remove from the right of the telephone number prefix. For example, if you enter 3 and the phone number is 5551234, the new phone number is 5551.
Prefix to Add	Defines the number or string that you want added to the front of the telephone number. For example, if you enter 9 and the phone number is 1234, the new number is 91234.
Suffix to Add	Defines the number or string that you want added to the end of the telephone number. For example, if you enter 00 and the phone number is 1234, the new number is 123400.
Number of Digits to Leave	Defines the number of digits that you want to keep from the right of the phone number. For example, if you enter 4 and the phone number is 00165751234, then the new number is 1234.

Parameter	Description
NPI	Defines the Numbering Plan Indicator (NPI). ▪ **[0]** Unknown (default) ▪ **[9]** Private ▪ **[1]** E.164 Public ▪ **[-1**] Not Configured = value received from PSTN/IP is used **Notes:** ▪ This parameter is applicable only to number manipulation tables for IP-to-Tel calls. ▪ NPI can be used in the SIP Remote-Party-ID header by using the 'EnableRPIHeader' and 'AddTON2RPI' parameters. ▪ For more information on available NPI/TON values, see Numbering Plans and Type of Number on page 49.
TON	Defines the Type of Number (TON). ▪ If you selected 'Unknown' for the NPI, you can select Unknown **[0].** ▪ If you selected 'Private' for the NPI, you can select Unknown **[0],** Level 2 Regional **[1],** Level 1 Regional **[2],** PISN Specific **[3]** or Level 0 Regional (Local) **[4].** ▪ If you selected 'E.164 Public' for the NPI, you can select Unknown **[0],** International **[1],** National **[2],** Network Specific **[3],** Subscriber **[4]** or Abbreviated **[6].** The default is 'Unknown'. **Notes:** ▪ This parameter is applicable only to number manipulation tables for IP-to-Tel calls. ▪ TON can be used in the SIP Remote-Party-ID header by using the 'EnableRPIHeader' and 'AddTON2RPI' parameters. ▪ For more information on available NPI/TON values, see Numbering Plans and Type of Number on page 49.
Presentation	Enables caller ID. ▪ Not Configured = Privacy is determined according to the Caller ID table. ▪ **[0]** Allowed = Sends Caller ID information when a call is made using these destination/source prefixes. ▪ **[1]** Restricted = Restricts Caller ID information for these prefixes. **Notes:** ▪ This field is applicable only to number manipulation tables for source phone number manipulation. ▪ If this field is set to **Restricted** and the 'Asserted Identity Mode' (AssertedIdMode) parameter is set to **P-Asserted**, the From header in the INVITE message includes the following: From: 'anonymous' <sip: anonymous@anonymous.invalid> and 'privacy: id' header.

4.10.1 Number Normalization Examples

Two examples are provided below for number normalization. The examples are based on the following assumptions:

- PBX with prefix (local) number 333
- 4-digit extension numbers that begin with the digit 1 (i.e., 1xxx)
- National area code is 206
- Country code is 1

4.10.1.1 Modifying E.164 Numbers to PBX / PSTN Format for Outbound Calls

Outbound calls refer to calls made by Lync clients to a PBX / PSTN number:

1. **Local Calls within PBX:** The caller dials only the last four digits (e.g., 1212). Lync translates (normalizes) the phone number into an E.164 number format: +12063331212 (where +1 is the country code, 206 the local area code, and 333 the PBX prefix number). The Manipulation table is configured to send only the last four digits to the PBX (i.e., 1212).
2. **National Calls to the Same Area Code:** The caller dials 9 for an external line, and then dials a 7-digit telephone number (e.g., 9-555-4321). Lync translates (normalizes) the phone number into an E.164 number format: +12065554321 (where +1 is the country code, 206 the local area code, 5554321 the phone number). The Manipulation table is configured to remove (strip) the first five digits and add 9 as a prefix to the remaining number. Therefore, the Enhanced Gateway sends the number 95554321 to the PBX, and then the PBX sends the number 5554321 to the PSTN.
3. **National Calls to a Different Area Code:** The caller dials 9 for an external line, the out-of-area code, and then a 7-digit telephone number (e.g., 9-503-331-1425). Lync translates (normalizes) the phone number into an E.164 number format: +15033311425 (where +1 is the international code, 503 the out-of area code, 3311425 the phone number). The Manipulation table is configured to remove (strip) the first two digits (i.e., +1), then add 9 as a prefix to the remaining number. Therefore, the Enhanced Gateway sends the number 95033311425 to the PBX, and then the PBX sends the number 5033311425 to the PSTN.
4. **Dialing International Calls: The calle**r dials 9 for an external line, the access code for international calls (e.g., 011 for the US), the country code (e.g., +44 for the UK), the area code (e.g., 1483), and then a 6-digit telephone number (e.g., 829827). Lync translates (normalizes) the phone number into an E.16*4* number format: +441483829827 (where +44 is the country code, 1483 the area code, 829827 the phone number). The Manipulation table is configured to remove the first digit (e.g., +), and add the external line digit (e.g., 9) and the access code for international calls (e.g., 011 for the US) as the prefix. Therefore, the Enhanced Gateway sends the number 9011441483829827 to the PBX and the PBX, in turn, sends the number 011441483829827 to the PSTN.

The configuration of the above scenarios is shown in the Figure 4-32.

Figure 4-32: Destination Phone Number Manipulation Table for IP→Tel Calls

Destination Phone Number Manipulation Table for IP -> Tel Calls
Add +
Insert +
Index
Destination Prefix
Source Prefix
Source IP Address
Source Host Prefix
Destination Host Prefix
Prefix to Add
Suffix to Add
1 +1206333 * * * *
2 +206 * * * * 9
3 +1 * * * * 9
4 + * * * * 9011
Page 1 of 1 Show 10 records per page
View 1 - 4 of 4

4.10.1.2 Modifying PBX, Local, and National Calls to E.164 Format for Inbound Calls

Inbound calls refer to calls received by Lync clients from the PBX / PSTN:

1. **Local Calls from the PBX / PSTN:** The PBX user only dials a 4-digit extension number of the Lync client (e.g., 1220). The Manipulation table is configured to normalize the number into E.164 format and adds the prefix +1206333 to the extension number. Therefore, the Enhanced Gateway sends the number +12063331220 to Lync, which relays the call to the Lync client.
2. **National Calls with the Same Area Code:** The PSTN user dials a 7-digit phone number (e.g., 333-1220), which is received by the Enhanced Gateway. The Manipulation table is configured to normalize the number into E.164 format and adds the prefix +1206 to the number. Therefore, the Enhanced Gateway sends the number +12063331220 to Lync, which relays the call to the Lync client.
3. **National Calls from a Different Area Code:** The PSTN user dials the national area code and then a 7-digit phone number (e.g., 206-333-1220), which is received by the Enhanced Gateway. The Manipulation table is configured to normalize the number into E.164 format and adds the prefix +1 to the number. Therefore, the Enhanced Gateway sends the number +12063331220 to Lync, which relays the call to the Lync client.
4. **International Calls:** The PSTN international (overseas) caller dials the international access and country code (e.g., 001 for the US), the national area code, and then a 7-digit phone number (e.g., 206-333-1220), which is received by the Enhanced Gateway. The Manipulation table is configured to normalize the number into E.164 format, by removing the first two digits (e.g., 00) and adding the prefix plus sign (+). Therefore, the Enhanced Gateway sends the number +12063331220 to Lync, which relays the call to the Lync client.

Note: The international and country codes that are received by the Enhanced Gateway depend on the respective country's PSTN numbering rules.

The configuration of the above scenarios is shown in the figure below:

Figure 4-33: Destination Phone Number Manipulation Table for Tel→IP Calls

Destination Phone Number Manipulation Table for Tel -> IP Calls
Add +
Insert +
Index
Destination Prefix
Source Prefix
Source Trunk Group
Destination IP Group
Prefix to Add
Suffix to Add
1 1xxx * -1 -1 +1206333
2 333 * -1 -1 +1206
3 206 * -1 -1 +1
4 00 * -1 -1 +
Page 1 of 1 Show 10 records per page
View 1 - 4 of 4

4.11 Miscellaneous Configuration

This step describes the miscellaneous Gateway configuration.

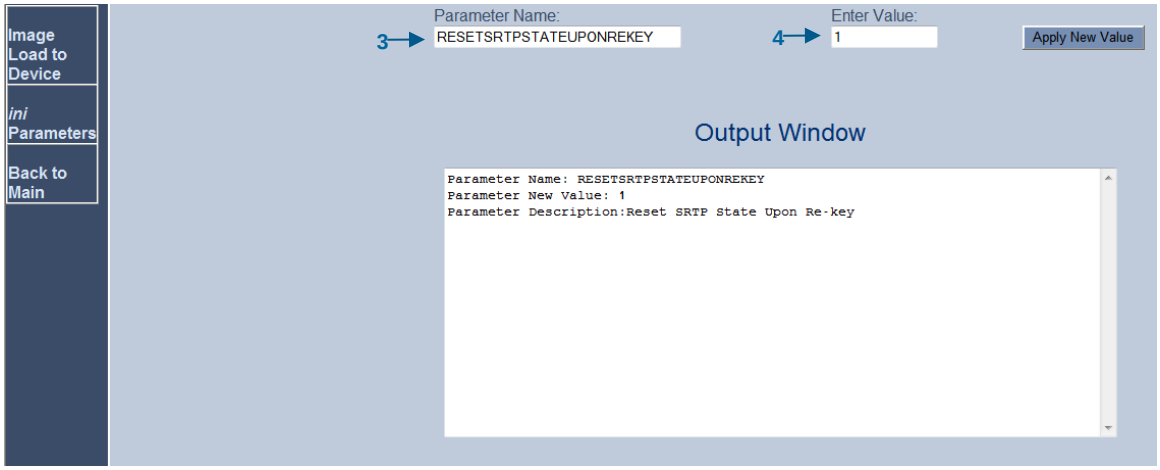
4.11.1 Configuring SRTP Behavior upon Rekey Mode

This section describes how to configure SRTP Behavior upon Rekey Mode.

➢ **To configure SRTP Behavior upon Rekey Mode:**

1. Open the Admin page by appending the case-sensitive suffix 'AdminPage' to the Gateway's IP address in your Web browser's URL field (e.g., http://10.15.4.22/AdminPage).
2. On the left pane, click ***ini*** Parameters.

Figure 4-34: AdminPage



3. In the 'Parameter Name' field, enter RESETSRTPSTATEUPONREKEY.
4. In the 'Enter Value' field, enter **1**.
5. Click the **Apply New Value** button.

A Configuring Lync Server 2013

This appendix describes how to configure Microsoft Lync Server 2013 topology builder to operate with the AudioCodes Enhanced Gateway.

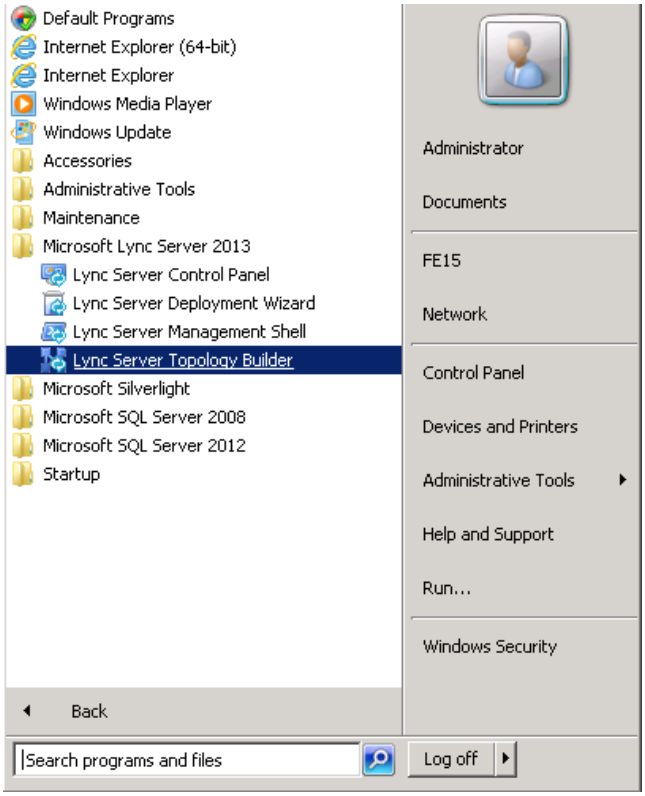
Note: Routes, Dial plans, voice policies, and PSTN usages are also necessary for Enterprise voice deployment; however, they are beyond the scope of this document.

The procedure below describes how to configure the Gateway as an IP / PSTN Gateway.

➢ **To configure the Gateway as an IP/PSTN Gateway and associate it with the Mediation Server:**

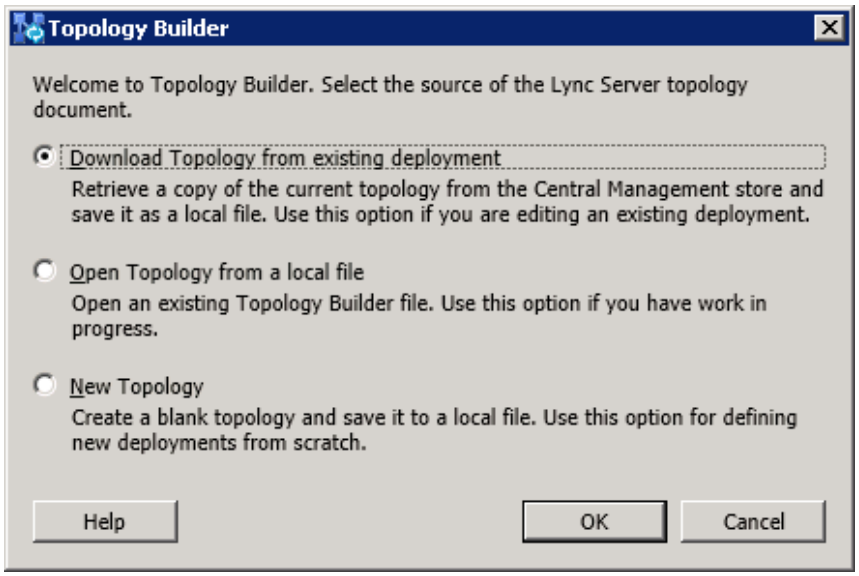
1. On the Microsoft Lync server where the Topology Builder is installed, start the Lync Server 2013 Topology Builder (Point to **Start** menu > **All Programs** > **Lync Server Topology Builder**).

Figure A-1: Starting the Lync Server Topology Builder



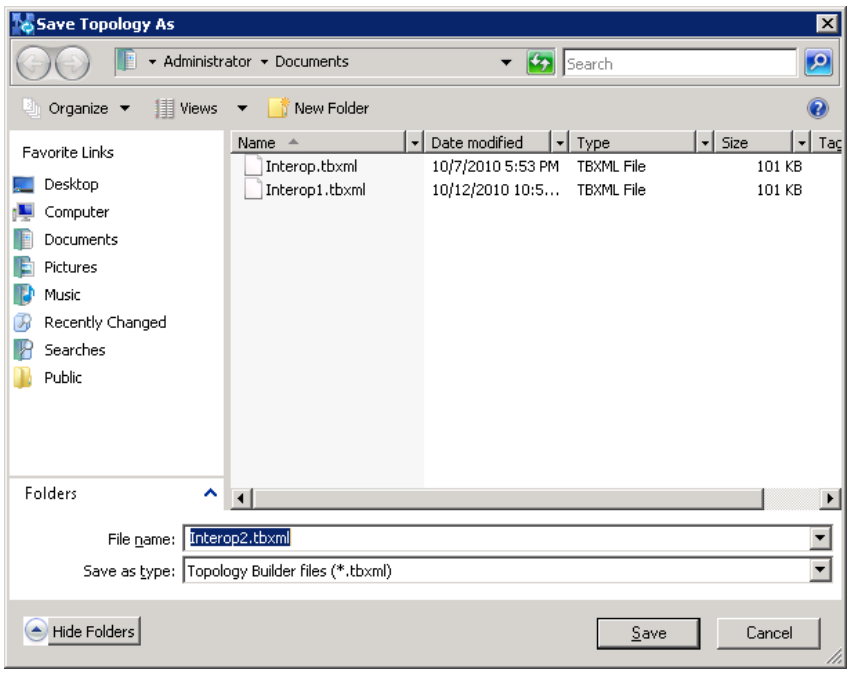
The Topology Builder screen is displayed:

Figure A-2: Topology Builder Options


Topology Builder
Welcome to Topology Builder. Select the source of the Lync Server topology document.
Download Topology from existing deployment
Retrieve a copy of the current topology from the Central Management store and save it as a local file. Use this option if you are editing an existing deployment.
Open Topology from a local file
Open an existing Topology Builder file. Use this option if you have work in progress.
New Topology
Create a blank topology and save it to a local file. Use this option for defining new deployments from scratch.
Help
OK
Cancel

2. Select the **Download Topology from existing deployment** option, and then click **OK**; you are prompted to save the downloaded Topology:

Figure A-3: Save Topology

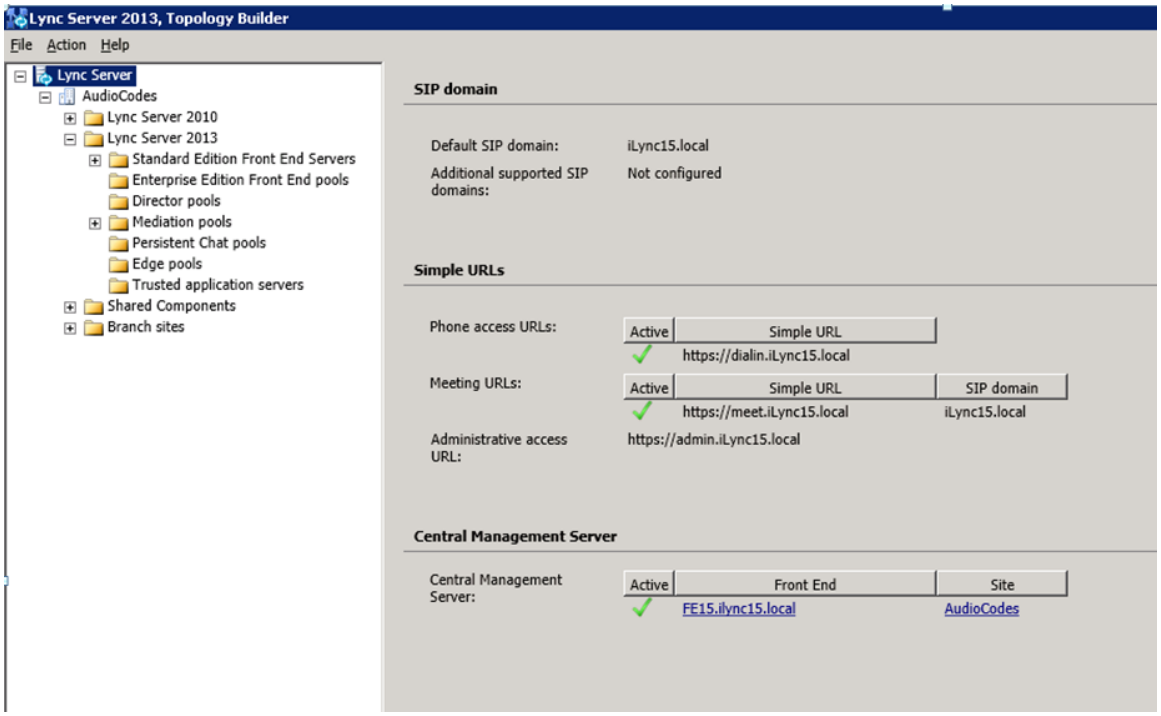


3. Enter a name for the Topology file, and then click **Save**.

   This action enables you to roll back from any changes you make during the installation.

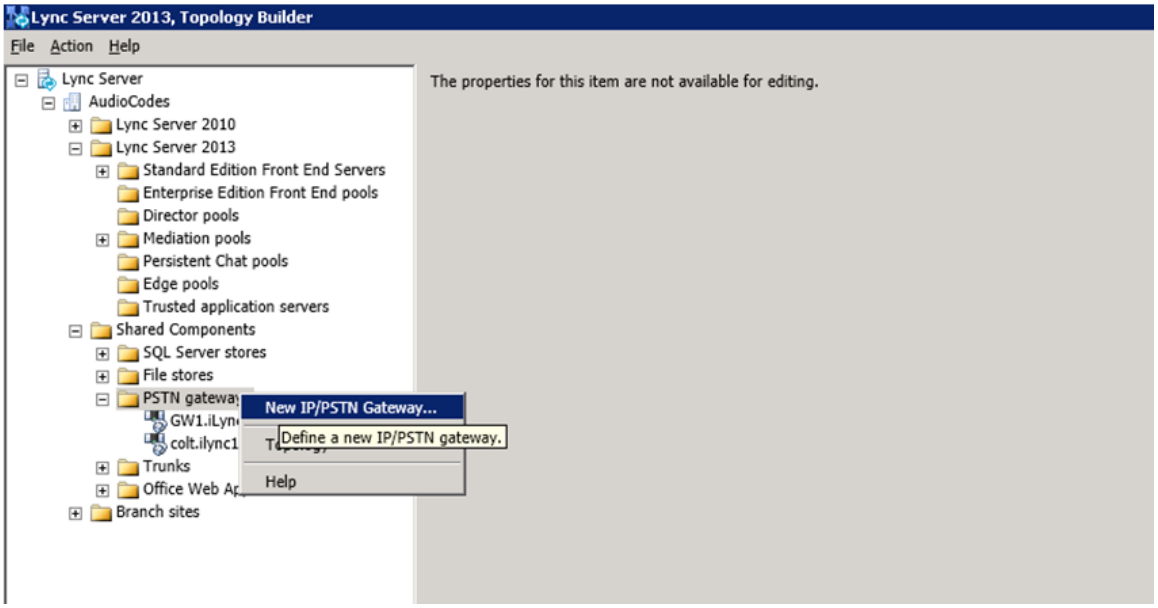
The Topology Builder screen with the downloaded Topology is displayed:

Figure A-4: Downloaded Topology



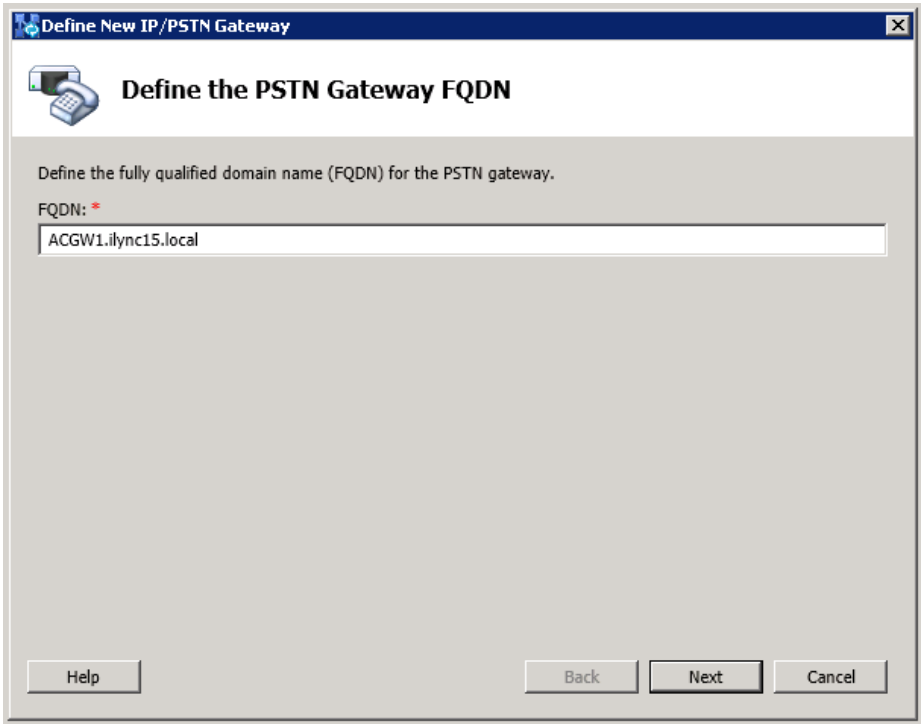
4. In the Navigation tree, select **Lync Server 2013** > **Site name i.e. AudioCodes** > **Shared Components** > **PSTN Gateways**.
5. Right-click the **PSTN gateways** folder, and then in the pop-up dialog, choose **New IP/PSTN Gateway** as shown below:

Figure A-5: Choosing New IP/PSTN Gateway



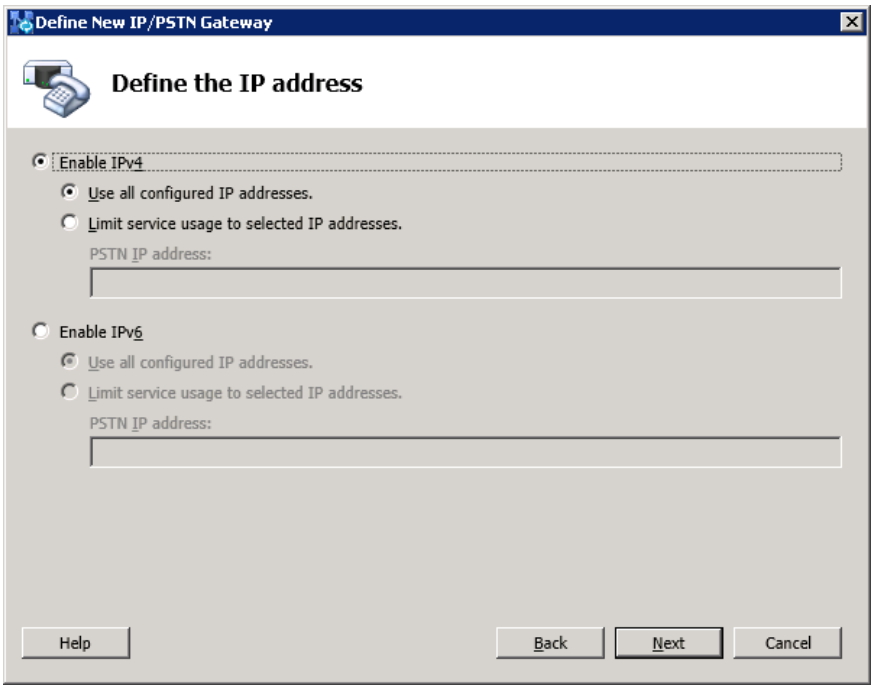
The following dialog box appears:

Figure A-6: Define New IP/PSTN Gateway



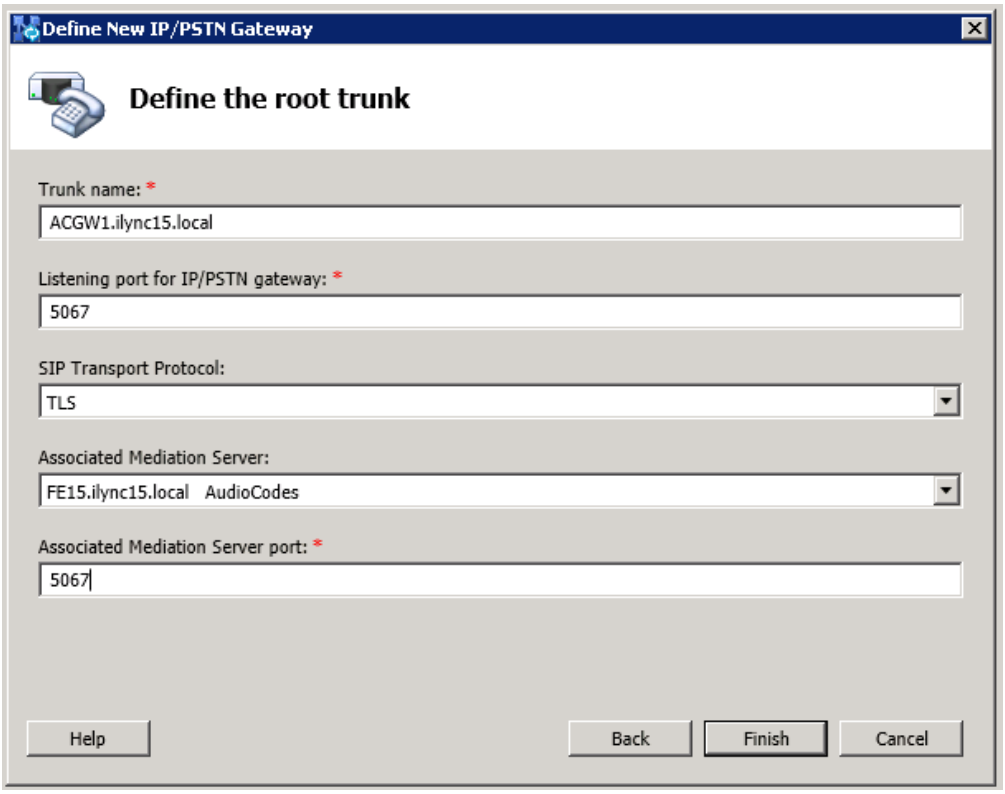
6. In the 'FQDN' field, enter the Fully Qualified Domain Name (FQDN) of the Gateway (e.g., "ACGW1.ilync15.local"); this FQDN should be updated in the relevant DNS record ,and then click **Next**; the Define the IP address screen is displayed:

Figure A-7: Define the IP Address



7. Define the listening mode (IPv4 or IPv6) of the IP address of your new PSTN gateway, and click **Next**; the Define the root trunk screen is displayed:

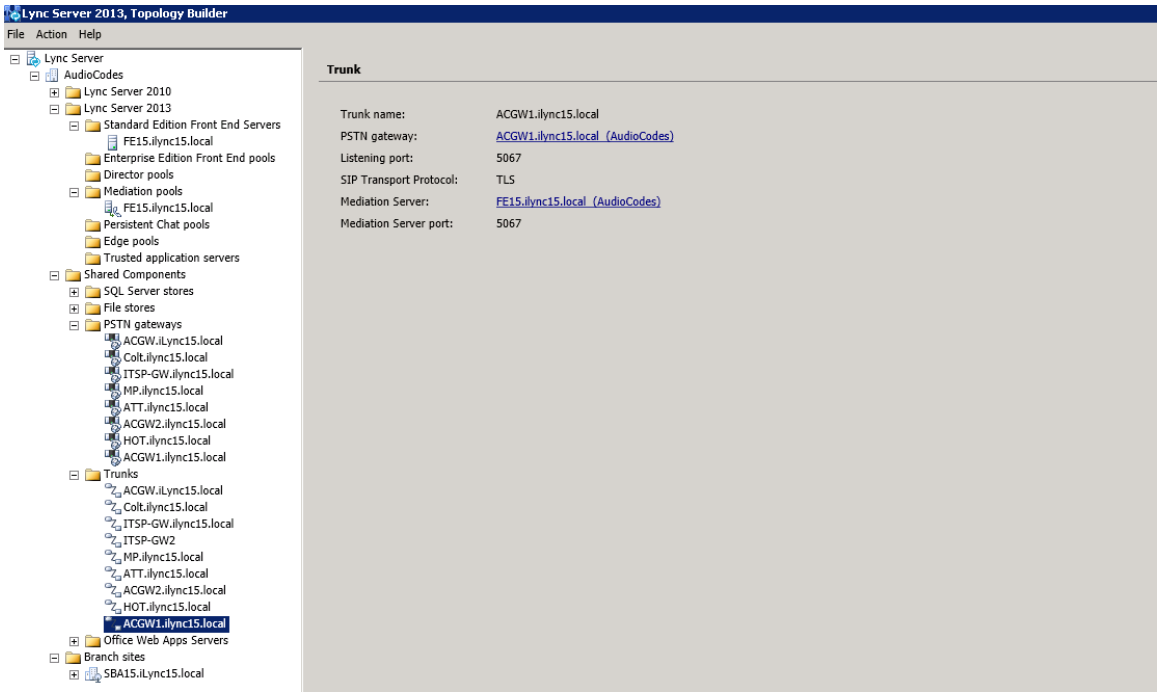
Figure A-8: Define the Root Trunk



8. In the Trunk name field, define a *root trunk* for the PSTN gateway. A trunk is a logical connection between a Mediation Server and a gateway uniquely identified by the combination (Mediation Server FQDN, Mediation Server listening port (TLS or TCP) : gateway IP and FQDN, gateway listening port):
   - When defining a PSTN gateway in the Topology Builder, you must define a root trunk to successfully add the PSTN gateway to your topology.
   - The root trunk cannot be removed until the associated PSTN gateway is removed.
9. In the 'Listening Port for IP/PSTN' gateway field, type the listening port that the Gateway uses for SIP messages from the Mediation Server that will be associated with the root trunk of the PSTN gateway (i.e. 5067).
10. In the 'SIP Transport Protocol' field, select the transport type (i.e. TLS) that the trunk uses.
11. In the 'Associated Mediation Server' field, select the Mediation Server pool to associate with the root trunk of this PSTN Gateway.
12. In the 'Associated Mediation Server port', type the listening port that the Mediation Server will use for SIP messages from the Gateway (i.e. 5067).
13. Click **Finish**.

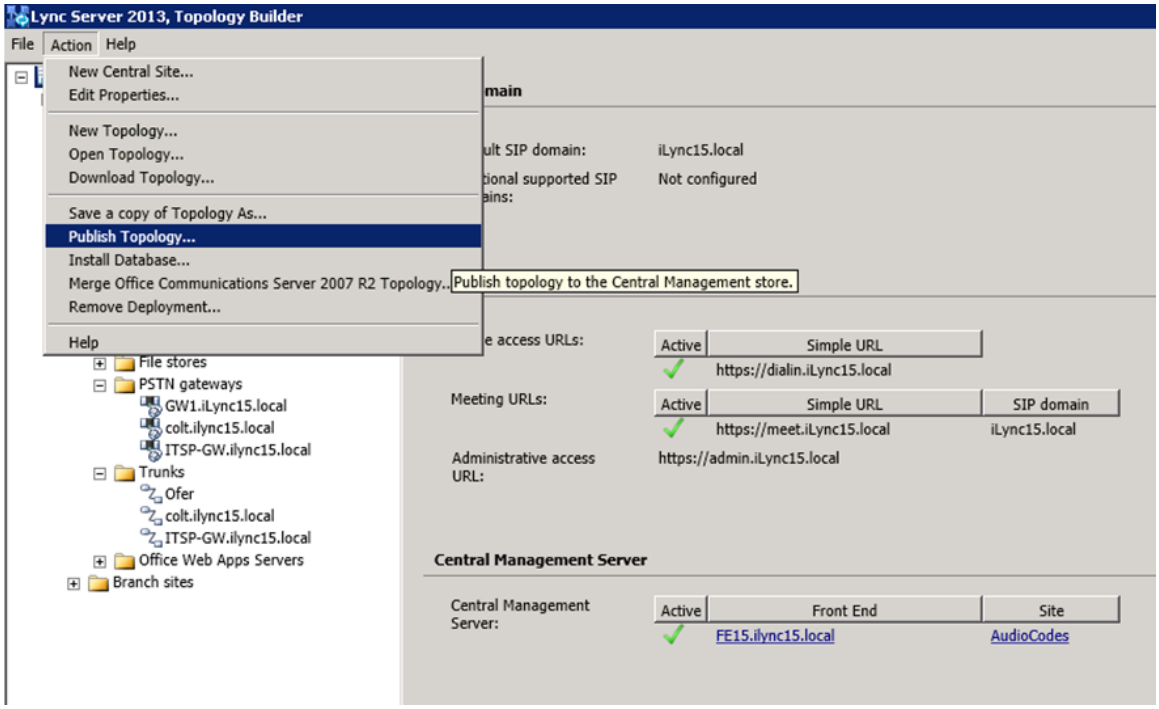
The Gateway is added as a PSTN Gateway and a trunk is created as shown below:

Figure A-9: Gateway Added as an IP/PSTN Gateway and Trunk created



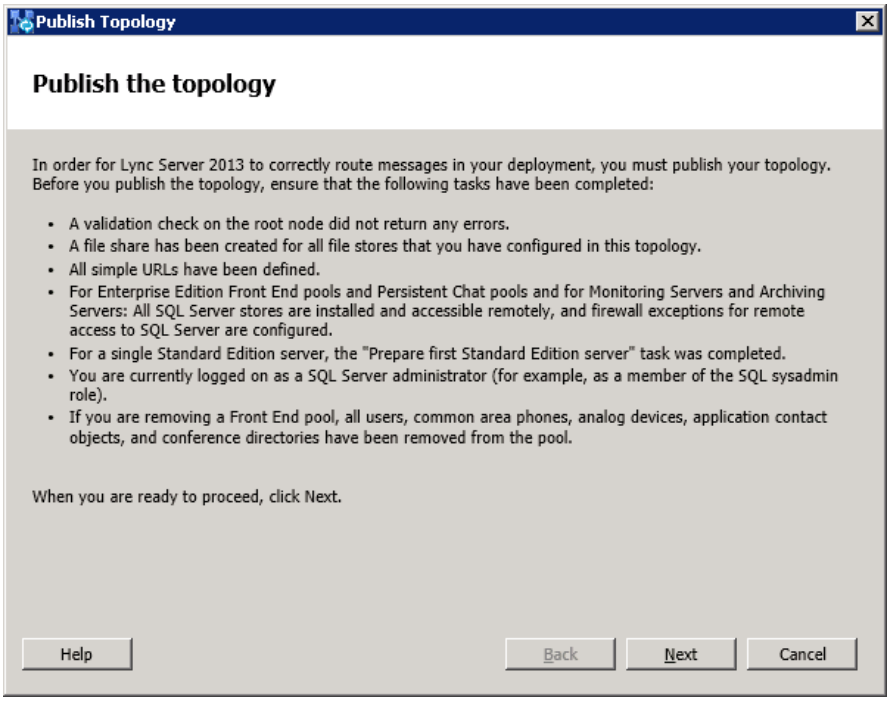
14. Publish the Topology; In the Navigation tree, select the root item **Lync Server**, and then in the Main Menu, choose **Action** > **Publish Topology**.

Figure A-10: Choosing Publish Topology



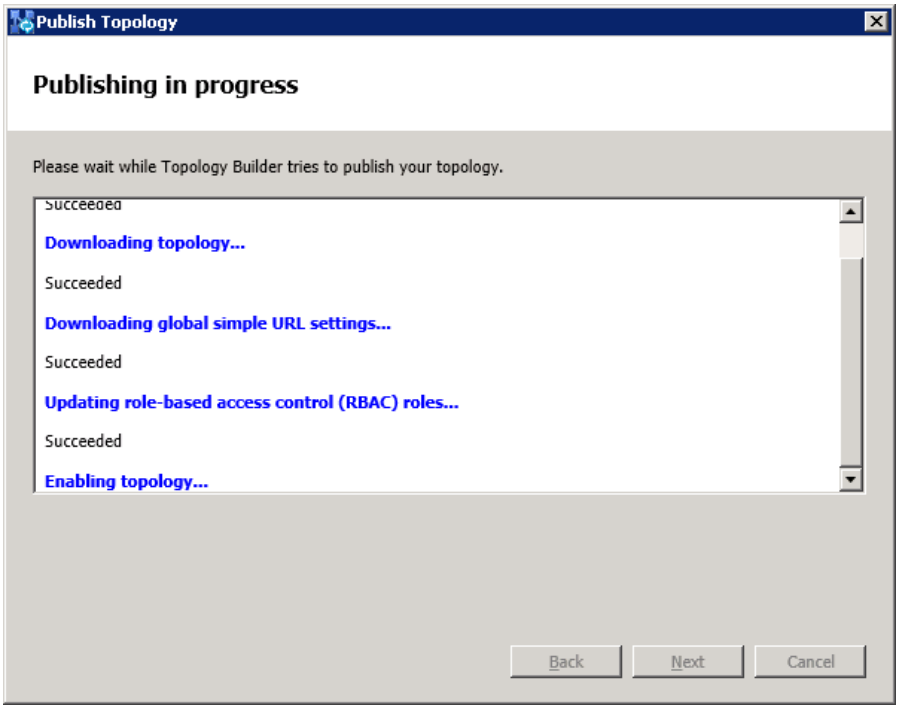
The Publish Topology screen is displayed:

Figure A-11: Publish Topology Screen


Publish Topology
Publish the topology
In order for Lync Server 2013 to correctly route messages in your deployment, you must publish your topology. Before you publish the topology, ensure that the following tasks have been completed:
A validation check on the root node did not return any errors.
A file share has been created for all file stores that you have configured in this topology.
All simple URLs have been defined.
For Enterprise Edition Front End pools and Persistent Chat pools and for Monitoring Servers and Archiving Servers: All SQL Server stores are installed and accessible remotely, and firewall exceptions for remote access to SQL Server are configured.
For a single Standard Edition server, the "Prepare first Standard Edition server" task was completed.
You are currently logged on as a SQL Server administrator (for example, as a member of the SQL sysadmin role).
If you are removing a Front End pool, all users, common area phones, analog devices, application contact objects, and conference directories have been removed from the pool.
When you are ready to proceed, click Next.
Help
Back
Next
Cancel

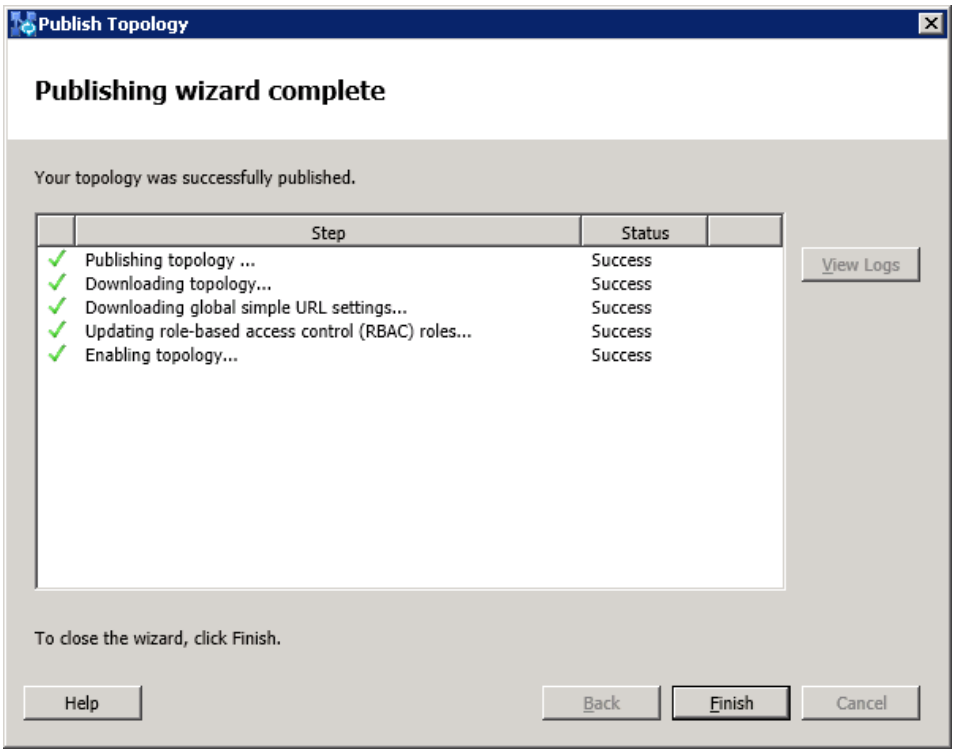
15. Click **Next**; the Topology Builder starts to publish your topology, as shown below:

Figure A-12: Publish Topology Progress Screen



16. Wait until the publishing topology process completes successfully:

Figure A-13: Publish Topology Successfully Completed



17. Click **Finish**.

Reader's Notes

AudioCodes

Configuration Note

www.audiocodes.com